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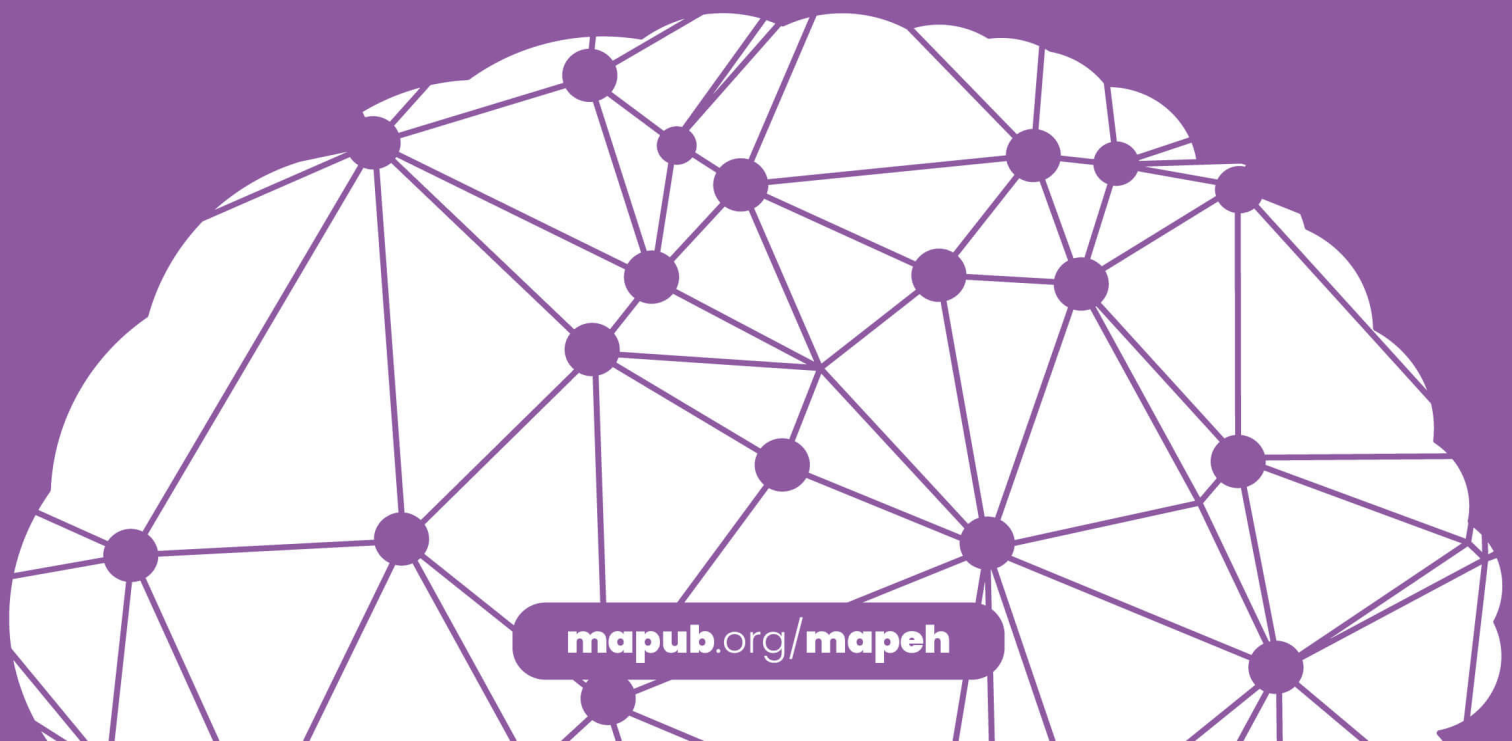

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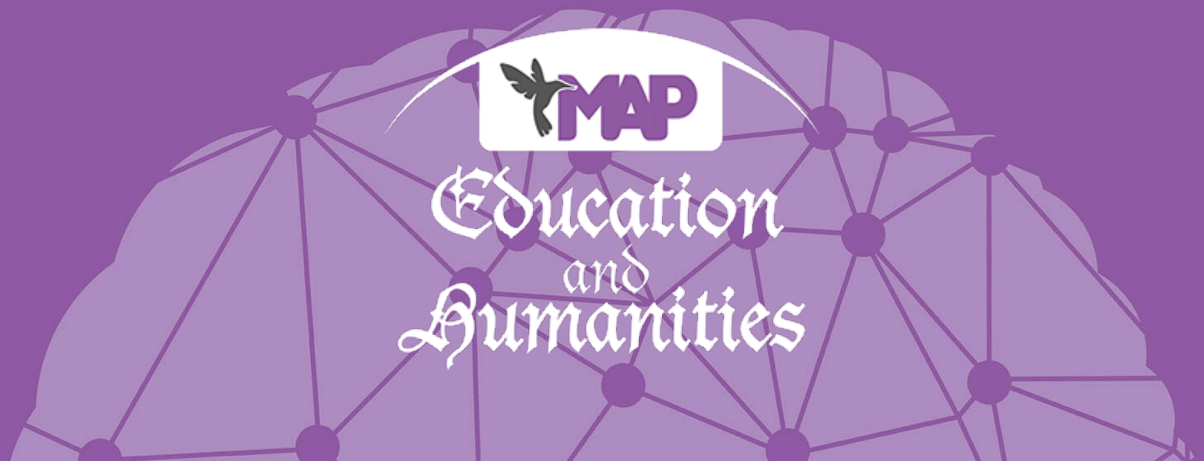

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ORIGINAL RESEARCH PAPER

THE EFFECT OF GENDER AND AGE ON COMPUTER SELF-EFFICACY, COMPUTER ANXIETY AND PERCEIVED ENJOYMENT AMONG AUSTRIAN SECONDARY SCHOOL TEACHERS

Eva Gröstenberger[1], **Adolf Selinger**[2]

[1] ***Private Pädagogische Hochschule Burgenland***, *Eisenstadt, Austria*
[2] ***Private Pädagogische Hochschule Burgenland***, *Eisenstadt, Austria*

Correspondence concerning this article should be addressed to Eva Gröstenberger - eva.groestenberger@ph-burgenland.at and Adolf Selinger - adolf.selinger@ph-burgenland.at, Private Pädagogische Hochschule Burgenland, Eisenstadt, Austria.

ABSTRACT

The current study examines how gender and age effect computer self-efficacy, computer anxiety and perceived enjoyment among Austrian secondary school teachers in the context of working with learning management systems. The survey was answered by 383 teachers in the midst of the Covid-crisis between December 2020 and February 2021. The results show that gender has a significant effect on computer anxiety, with female participants experiencing higher levels across all age groups. Furthermore, age emerges to make a difference in computer self-efficacy: younger teachers seem to rate their computer skills higher than their older colleagues. Based on the findings, suggestions for improvements in teacher education and training are made and the limitations of the study are discussed.

Keywords: computer self-efficacy, computer anxiety, perceived enjoyment, gender, age

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1. Introduction

The last few years of the Covid pandemic have brought the integration of information and communication technology (ICT) in educational settings into sharp focus. The Covid crisis and the resulting school closures in 2020 demonstrated how unprepared many instructors were for distance learning and the use of the digital tools required. In this context, the *National Education Report Austria* (2021) outlines that this problem was not entirely due to an absence of digital devices or inadequate infrastructure, even though such external barriers evidently played a role in some school areas. In fact, the report states that many teachers were found to lack the appropriate skills to efficiently move their teaching to online formats, although the Ministry of Education as well as local school authorities had made heavy investments in the provision of digital devices and school infrastructure prior to the outbreak of the crisis.

Such an apparent shortcoming of an educational system is not only problematic in times of crises such as school closures, but has to be discussed on a larger scale. In this context, Bećirović (2023) emphasizes the need for digital pedagogy, for "digitally competent teachers who are able to impart digital skills and abilities to their students" (p. 40). This seems of particular relevance in a time of rapid technological advancement, when educational systems must assume their responsibility and prepare young people for the requirements of the new labour market (Bećirović, 2023). Accordingly, in Austria, as elsewhere, the importance to assess teachers' ability to integrate the use of technology in the classroom and by doing so implicitly transferring their skills and knowledge to their students, has received renewed attention.

On the one hand, the offer of teacher training courses focusing on the use of ICT across all subject matters has been extended. On the other hand, attempts have been made to introduce perception-based measures in the form of self-assessment tools, which allow teachers to rate their computer knowledge and skills while at the same time accessing a wealth of training opportunities for systematic competence building (Brandhofer et al., 2020). In theory, when it comes to ICT in the classroom, one may thus argue that Austrian teachers should be among the best prepared in Europe. In practice, however, there is anecdotal evidence provided by students and parents that ICT integration still varies greatly among schools and can by no means be described as standardized.

Acknowledging the fact that providing teachers with the right ICT infrastructure and training is evidently not sufficient, the *National Education Report Austria* (2021) admits that a nationwide digitalization strategy in education can only be successful if teachers are persuaded of the significance of digital media, want to use them, and are motivated to promote digital skills. Actually, the role of teachers playing a crucial role in the sustainable implementation of technological innovations in schools – regardless of the external circumstances - has already been identified by Euler et al. (2006) and has been further explored in a number of studies. For instance, Ertmer et al. (2012) identify two types of barriers that can impact teachers' use of technology. On the one hand, first-order barriers refer to external factors such as inadequate infrastructure, lack of training, or insufficient support. On the other hand, second-order barriers are internal to the teachers themselves and involve their confidence in using technology, their beliefs about teaching and learning, and their perceptions of technology's value. These internal barriers are considered to play an even more crucial role than external barriers, making the use of ICT rather a personal choice largely unaffected by the presence or absence of external resources or obstacles (Ertmer et al., 2012; Mcgrail, 2005; Mendieta, 2012; William Sugar et al., 2004).

Consequently, the challenge, it appears, is to identify which personal factors act and interact to influence a teacher's individual level of willingness to adopt technology in the classroom. This question is of particular relevance in an Austrian context, where external barriers to the use of digital media in the classroom seem to have been largely eliminated. To shed some light on this question, the current paper thus attempts to closer investigate three potentially relevant internal factors, that is computer self-efficacy, computer anxiety, and perceived enjoyment, in order to gain a better insight into teachers' attitudes towards and acceptance of ICT. As independent variables gender and age are used, as these are considered to have a substantial influence on the individual's technological responses in many ICT studies. To be more precise, gender has been argued to have an effect on the development of ICT beliefs due to gendered socialization processes (Barker & Aspray, 2006; Fisher & Margolis, 2003; Volman et al., 2005). Furthermore,

age is an interesting factor to investigate, as there still is a widespread persistent prejudice against older teachers, who are believed to implement ICT less effectively than their male counterparts, while at the same time there is empirical evidence that self-efficacy increases with age (Bandura, 2006).

2. Literature review

In Austria, the impact of internal or personal factors on ICT usage in educational settings was the subject of a mixed-method study by Gabriel (2011), which focused on the personalities of instructors. The study evaluated the extent to which teachers at secondary commercial colleges in Burgenland, Austria, utilize learning management systems and discovered a significant relationship between the frequency of utilization and the personality trait of 'conscientiousness': teachers with greater levels of conscientiousness utilized the platform more frequently. There were no significant differences based on gender in terms of usage intensity. Similarly, the age of the participating instructors had no significant effect on usage intensity. However, Gabriel discovered that usage intensity increased with age among female instructors. In further support of the importance of the teacher as a relevant factor, Gröstenberger (2020) found that even the use of online practice materials by secondary school students varies according to their respective school or teacher. Students taught by female teachers were found to practice significantly more online than students taught by male teachers, while the teachers' teaching experience emerged as not having an effect on the students' practice behavior. Both studies establish the teacher as a decisive factor in digitally supported learning environments and support the claim that "teachers are influenced by a wide range of contextual and personal factors that affect their perception of technology and, consequently, the learning opportunities they provide their students" (Mendieta, 2012, p. 177).

On a more global scale, researchers in the field of ICT have been attempting to identify factors that influence people's acceptance and effective use of information technologies. Most prominently, Davis et al. (1989) devised the Technology Acceptance Model (TAM) to explain users' behavioral intentions towards adopting a technological innovation. Within this model, internal and external factors that can potentially influence the individual's technology adoption are considered, among them computer self-efficacy, computer anxiety, and perceived enjoyment. These three constructs are generally considered critical factors in determining an individual's ability to face the challenges and to take advantage of the opportunities of an increasingly digital world. They draw heavily on Bandura's (1986) social cognitive theory, which emphasizes the importance of self-beliefs in influencing human behavior. To be more precise, computer self-efficacy is defined as the "degree to which an individual believes that he or she has the ability to perform a specific task/job using the computer", computer anxiety refers to the degree of "an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers", while perceived enjoyment is considered to measure the extent to which "the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use" (Venkatesh & Bala, 2008, p. 7).

To start with, computer self-efficacy is part of the general construct of self-efficacy (Bandura, 1977) and must be examined with regard to a specific tool or device in a specific context (He & Freeman, 2010). As can be expected, higher levels of computer self-efficacy lead to higher levels of computer use across a number of educational disciplines across different countries (Aktağ & Tuzcuoğlu, 2016; Awofala et al., 2017; Compeau & Higgins, 1995; Teo, 2008). In their study with North American undergraduate business students, He and Freeman (2010) examined computer self-efficacy in relation to gender and age. Based on the assumption that "computing has developed a masculine image on par with traditionally masculinized subjects such as mathematics, physics and engineering" (p. 230), they expected their male participants to have higher levels of computer-self-efficacy. However, this hypothesis was refuted. However, age emerged as an important antecedent of computer-self-efficacy, which is in line with general self-efficacy increasing with age or rather experience (Bandura, 2006). Moreover, He and Freeman (2010) examined the potential predictors of computer self-efficacy and found computer anxiety to be one of them.

Computer anxiety is based on the larger general concept of anxiety, which Arnold and Brown (1999) regard as "quite possibly the most pervasive affective factor that impedes the learning process" (p. 8) and as such also plays a significant role in the educational usage of computers (Chua et al., 1999). Its apparent counterpart, that is perceived enjoyment, constitutes the third variable under investigation in the current study. It was first included into the measurement of ICT acceptance in the

Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003) and refers to the construct of hedonic motivation, that is fun or pleasure resulting from using a technology. In general, anxiety as a negative emotion is associated with worry, concern and nervousness, often linked to low self-esteem, risk aversion, and inhibition and can be experienced by degree (Brown, 2007). Moreover, computer anxiety is a 'trait' rather than a 'state' anxiety (Oxford, 1999), inherent to a specific situation involving computers (or other digital devices) and can thus be changed and influenced. Simsek (2011) examined the relationship between computer anxiety and computer self-efficacy among Turkish elementary and secondary teachers and students. He established a significant, moderate, negative correlation between computer self-efficacy and computer anxiety and found male participants to display lower levels of computer anxiety and higher levels of computer self-efficacy in comparison to their female counterparts. As for significant differences in male and female computer anxiety levels, there is global evidence that females generally experience higher levels (Awofala et al., 2020; Mcilroy et al., 2001; Moradi Rekabdarkolaei & Amuei, 2008; Sultan & Kanwal, 2017).

3. Methodology

The present study investigates the relationship between computer self-efficacy (CSE), computer anxiety (CANX) and perceived enjoyment (ENJ) among Austrian secondary teachers in the context of using learning management systems. Furthermore, the influence of gender and age on CSE, CANX and ENJ are examined. The following hypotheses are tested:

Hypothesis 1: There is a correlation between computer self-efficacy, computer anxiety and perceived enjoyment in the context of using learning management systems.

Hypothesis 2: Gender and age do not significantly interact in the effect on the teachers' computer self-efficacy, computer anxiety and perceived enjoyment in the context of using learning management systems.

Hypothesis 3: There is a significant effect of gender on the teachers' computer self-efficacy, computer anxiety and perceived enjoyment in the context of using learning management systems.

Hypothesis 4: There is a significant effect of age on the teachers' computer self-efficacy, computer anxiety and perceived enjoyment in the context of using learning management systems.

3.1 Instruments

For the survey, the questionnaire is divided into two sections: items from Venkatesh & Bala (2008) TAM 3 and demographic data. The TAM questionnaire consists of 17 variables with 73 items. For the current paper, CSE, CANX and ENJ are taken into account. For all items of the independent variables a 7-Point-Likert-Scale with the following format was used:

1. strongly disagree
2. moderately disagree
3. somewhat disagree
4. neutral (neither disagree nor agree)
5. somewhat agree
6. moderately agree
7. strongly agree

The demographic information includes the participants' gender, year of birth, years of teaching experience, academic field, level of education (i.e. bachelor's, master's, PhD, or other), type of teacher training institution, and location and school type.

3.2 Participants

The online survey was completed by 383 participants (male: N = 153; female: N = 228; other: N = 2). Because the third group (other) is so small, only the groupings for men and women are taken into account in further calculations, where gender is concerned. The participants were grouped in three groups according to their age in 2021: age group 1 (up to 35 years), age group 2 (36 to 50 years) and age group 3 (older than 51 years). Teachers under the age of 35 make up the smallest age group (N = 48, 12.6%), followed by those between the ages of 36 and 50 (N = 138, 36.2%). More than half of the participants (N = 195, 51.2%) are over the age of 51. According to current statistics, the distribution of age in the study essentially corresponds with the overall age structure of

Austrian teachers (age up to 34: 24.1%, 35-49: 34.1% and 50: 41.7%) (*Lehrpersonen in Österreich*, 2023).

3.3 Procedure

The Open Source program LimeSurvey was used to collect the data through an online survey between December 2020 and February 2021. The questionnaire was issued to 6,385 secondary school teachers with active accounts on the PH-Online-Platform (www.ph-online.ac.at/ph-bgld), where teachers have to register for in-service training courses. The sample size should be at least 3683 when taking into account a level of 99% confidence, a margin of error of 0.02, and a population of roughly 32,000 teachers (z = 2.58, p =.5, e =.02, N = 32,000). The sample size should be at least 381 when taking into account a confidence interval of 95%, a margin of error of 0.05, and a population of roughly 32,000 teachers (z = 1.96, p=5, e =.05, N = 32,000).

3.4 Data analysis

A structural model that satisfies the suggested cut-off criteria for the chosen fit indices was found after a confirmatory factor analysis was used to verify the measurement model. The data was examined and descriptive statistics, standard deviation, means, analysis of variance (MANOVA) and correlations were calculated. AMOS 27 was used to calculate the variables CSE, CANX and ENJ. With the use of SPSS 27, all further calculations were done based on these variables.

In order to investigate whether gender and age significantly interact in the effect on CSE, CANX and ENJ a factorial MANOVA was performed. To be more precise, a two-way MANOVA was conducted to determine the influence of the two independent variables gender and age on the teachers' scores on a linear combination of these dependent variables and on each of them separately.

4. Results

To start with descriptive data on CSE, teachers under 35 (M = 5.55, SD = .88) have higher mean values than their colleagues between 36 and 50 (M = 4.83, SD = 1.26) and score higher than teachers older than 51 (M = 4.89, SD = 1.29). As for gender, the male participants (M = 4.93, SD = 1.30) display slightly higher CSE levels than their female counterparts (M = 4.86, SD = 1.28). Notably, in the group of teachers older than 51, there is almost no difference in CSE scores between female (M = 4.74, SD = 1.34) and male (M = 4.78, SD = 1.45) participants. In contrast, among middle-aged teachers (f: M = 4.68, SD = 1.25; m: M = 5.05, SD =1.26), the difference between male and female CSE levels is more prominent. Most interestingly, the pattern is reversed when it comes to the youngest group of teachers: in this age group women (M = 5.63, SD = .77) rate their CSE higher than men (M = 5.34, SD = 1.12.).

Second, the mean values for CANX increases as teachers get older (age group 1: M = 3.18, SD = .48; age group 2: M = 3.36, SD =.72; age group 3: M = 3.41, SD =.68). That is to say, younger teachers are less fearful of using computers than older ones. As for gender, female teachers (M = 3.44, SD = .74) across all age groups experience higher CANX levels than their male counterparts (M = 3.25, SD = .56): age group 1 (f: M = 3.23, SD = .52; m: M = 3.05, SD = .31), age group 2 (f: M = 3.52, SD = .85; m: M = 3.12, SD = .37), age group 3 (f: M = 3.45, SD = .70; m: M = 3.36, SD = .66). Accordingly, the most anxious teacher (M = 3.52, SD = 0.85) is female and between 36 and 50 years of age; the least anxious person (M = 3.05, SD = 0.31) is male and under 35 years of age.

Third, ENJ varies with age: the mean values for younger instructors (M = 5.68, SD = 1.06) are higher than those for age group 3 (M = 5.39, SD=1.40), followed by age group 2 (M = 5.29, SD = 1.44). Notably, female teachers in the youngest (M = 5.79, SD = .97) and oldest group (M = 5.52, SD =1.28) enjoy using the LMS more than male teachers (group 1: M = 5.39, SD = 1.28; group 3: M = 5.21, SD = 1.54). By comparison, in age group 2, male teachers (M = 5.46, SD = 1.38) score higher on ENJ than female teachers (M = 5.18, SD = 1.48).

To examine the first research question, a Pearson correlation coefficient was computed to assess the relationship between CSE, CANX and ENJ. CANX and ENJ were found to have a statistically significant moderate relationship (r = -.45, p < .001). The same is true for CANX and CSE (r = -.39, p < .001) as well as CSE and ENJ (r = .50, p < .001). (Table 1) Hypothesis 1 can thus be confirmed.

As concerns the second hypothesis, there is no statistically significant interaction effect between gender and age on a linear combination of CSE, CANX and ENJ: F (6, 746) = 1.11, p = .35; Wilk's Λ = 0.98. Similarly, when considering the variables separately, gender and age do not interact on CSE [(F(2,375) = 1.24, p = .29)], CANX [(F(2,375) = 2.08, p = .13)] or ENJ [(F(2,375) = 2.13, p = .12)]. The second hypothesis can be confirmed.

Table 1.
Correlations between CSE, CANX and ENJ

	N	M	SD	CSE	CANX	ENJ
CSE	381	4.89	1.29	-		
CANX	381	3.36	.68	-.39**	-	
ENJ	381	5.39	1.38	.50**	-.45**	-

**. Correlation is significant at the 0.01 level (2-tailed).

To examine the question whether CSE, CANX and ENJ vary significantly with gender in the context of using learning management systems (hypothesis 3) a MANOVA was calculated. There was a statistically significant difference in gender on the combination of all three variables: F (3, 373) = 3.56, p = .01; Wilk's Λ = 0.97, partial η^2 = .03. To be more precise, the results demonstrate that the effect of gender is significant on CANX [F(1, 375) = 6.13, p = .01] with a low effect size (η^2 = .02). For CSE [F(1, 375) = .05, p = .83] and ENJ [F(1, 375) = .63, p = .43] no significant effects based on gender could be found (Table 2).

Table 2.
The effect of gender and age on CSE, CANX, ENJ

		F(1,375)	p	η^2
Gender	CSE	.05	.83	.00
	CANX	6.13	.01	.02
	ENJ	.63	.43	.00
Age	CSE	5.21	.01	.03
	CANX	2.69	.07	.01
	ENJ	.57	.57	.00

To test if there is a significant effect of age on the teachers' CSE, CANX and ENJ in the context of using learning management systems (hypothesis 4) a MANOVA was conducted. There is a statistically significant difference in age on the combined variable (CSE, CANX and ENJ) F (6, 746) = 2.36, p = .03; Wilk's Λ = 0.96, partial η^2 = .02. It also revealed that there is a statistically significant difference in CSE based on age: F(2,375) = 5.21, p < .01 (Table 2). A Bonferroni test for multiple comparisons found that the mean value of CSE was significantly different between teachers in age group 1 and age group 2 (p = .002, 95% C.I. = .21, 1.23) and between teachers in age group 1 and age group 3 (p < .001, 95% C.I. = .31, 1.29). As for CANX and ENJ, no statistically significant differences could be found (Table 3).

Table 3.
Bonferroni Test for multiple comparisons

Age Group			Mean Difference (I-J)	SE	p	95% C.I.	
						Lower Bound	Upper Bound
CSE	1	2	.72*	.21	.002	.21	1.23
		3	.79*	.20	< .001	.30	1.28
	2	1	-.72*	.21	.002	-1.23	-.21
		3	.07	.14	1.000	-.27	.41
	3	1	-.79*	.20	< .001	-1.28	-.30
		2	-.07	.14	1.000	-.41	.27

*. The mean difference is significant at the .05 level.

5. Discussion

The present study establishes a correlation between computer self-efficacy, computer anxiety and perceived enjoyment, thereby confirming previous research results (Davis et al., 1989; He & Freeman, 2010; Simsek, 2011; Venkatesh et al., 2003). Moreover, in line with previous studies (Awofala et al., 2020; Mcilroy et al., 2001; Moradi Rekabdarkolaei & Amuei, 2008; Simsek, 2011; Sultan & Kanwal, 2017), female participants of all age groups score significantly higher on the computer anxiety scale than their male counterparts. This finding, however, cannot be related to significantly lower female computer self-efficacy levels. As in He and Freeman's study (2010), there are no significant differences between the male and the female computer self-efficacy scores. In fact, the group that rated their computer self-efficacy highest are actually women under 35 (M = 5.63, SD = 0.25). This is in itself an interesting outcome, as this group of participants seems to believe more strongly in their ability to use computers efficiently than their male counterparts, even though the latter display lower computer anxiety levels. One may thus argue that in this particular age group, i.e., teachers under the age of 35, computer anxiety is not a predictor of computer self-efficacy, which contradicts He and Freeman's (2010) findings. Further research is required to investigate this age group more closely to identify the factors that lead to the participants' perceptions of their ICT knowledge.

As for age differences, computer self-efficacy emerges to be influenced by age. That is to say, the older the teachers, the lower their computer self-efficacy. Indeed, such findings are in line with common age bias in the area of ICT usage and

bring to mind outdated notions of "digital natives", i.e. younger people that have grown up with digital devices and thus show more skills, competence and confidence in their usage, and "digital immigrants", in this case the older generation of teachers that grew up without being surrounded by technology and thus supposedly has to adapt to it (Prensky, 2001).

What is more, the results of this study show that self-efficacy does not necessarily increase with experience or age (Bandura, 2006). This claim may not hold true in the specific context of educational technology use and might be explained with the fast-moving world of ICT, in which experience that you earn might be obsolete and no longer applicable in a very short time. In this context, teacher training institutions might want to rethink the delivery of their training programmes in order for teachers not to lag behind technological innovations. Furthermore, considering the fact that teacher training might have an effect on computer self-efficacy, one might want to explore this point further and investigate whether the computer self-efficacy differences might be due to the change in teacher training opportunities as well as infrastructure improvements that have been under way in the last decade. Further research is needed to explore whether such factors might account for the apparent computer self-efficacy age gap.

6. Conclusion

Above all, there are evidently many factors that might influence the individual teacher's beliefs in their ICT competence and skills as well as their attitude towards technology. The present study has tried to consider two of them, i.e. gender and age, and its results must accordingly be put into perspective. Admittedly, the results could be biased by the fact that the survey was conducted during school lockdowns, which might have influenced the participants' responses. Moreover, the fact that the survey was carried out online might have been an additional obstacle for teachers with higher computer anxiety who might thus not have participated.

Notwithstanding, the study shows that an examination of self-beliefs might support teacher training institutions to tailor ICT training courses to their specific target groups. One may argue that investments in such diagnostic procedures might be more successful than mere investments in ICT infrastructure or training courses that do not consider individual differences. In this context, computer self-efficacy, in particular, seems a variable that should be given more attention in further research. To gain a more holistic picture, it might be worth considering more factors than can potentially influence this construct, such as the teacher training institution and the respective extent of curricular ICT integration, the ICT school policy, the school's staff development policy or the teachers' work experience. Above all, the rapid technological development requires innovative training formats, for example peer groups, professional learning groups or networks across different age groups, that can quickly and continuously help teachers to keep up with new technological challenges. Such measures might enhance the quality and efficiency of pre-service and in-service teacher training and turn teachers into life-long learning role-models for their students.

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ORIGINAL RESEARCH PAPER

THE EFFECTS OF GAMIFICATION ON STUDENT MOTIVATION AND ACHIEVEMENT IN LEARNING ENGLISH AS A FOREIGN LANGUAGE IN HIGHER EDUCATION

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

Gamification has grown tremendously in popularity and is now widely used in various fields including information and communication technology (ICT), healthcare, marketing, education and business. Its core principle revolves around the integration of elements from games into non-game environments with the ultimate goal of shaping behavior, enhancing motivation, and fostering increased engagement (Caponetto, 2014). The main aim of this study is to investigate the impact of gamification on student motivation and academic performance in the specific context of teaching English as a foreign language (EFL) at higher education institutions in Bosnia and Herzegovina. To conduct this study, a cohort of 202 students attending both private and public universities in Bosnia and Herzegovina was carefully selected using targeted snowball sampling techniques. The questionnaire distributed to the participants included 57 items from various areas, including academic achievement, frequency and proficiency in using language learning apps, motivation and attitudes towards app-based language learning, and perceived improvements in listening, speaking, reading and writing skills This is attributed to the use of apps to learn the English language (ELL). To analyze the gathered data, descriptive statistics, tests for normality, reliability analysis, and linear regression were employed. The results of the study indicate a significant impact of gamification strategies on students' motivation to learn English as a foreign language, as well as their overall success in EFL learning and academic achievement. In higher education settings, the inclusion of games has been shown to have a positive impact on students' listening, speaking, reading and writing skills. In addition, gamification contributes to the motivation of the students and thus increases their academic performance. The integration of games into education is expected to continue to evolve and lead to transformative changes in curricula, teaching methods and learning models. Consequently, acquiring ICT skills among academic staff is crucial to effectively mentoring students and ensuring successful educational experiences.

Keywords: gamification, student motivation, academic achievement, language skills, English language learning

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1. Introduction

Rapid advances in technology are increasing pressure on professionals in academia to improve their technological skills. This pressure is particularly pronounced for teachers, who are encouraged to move from traditional teaching methods to a more modern and technology-oriented approach (Godwin-Jones, 2015). One area that is growing rapidly is computer-based and mobile learning and language learning is no exception to this trend. The advent of mobile apps and devices introduced a transformative concept that forever changed the educational landscape: gamification. In education, the use of gamification means the integration of game components in conjunction with different teaching approaches to enhance language teaching and learning, with the primary goal of increasing motivation (Boudadi, 2020).

The need for the integration of game elements in courses was created due to the widespread presence of smartphones and applications in the everyday lives of students. Game-based language apps have high-engagement potential, which promotes and maintains motivation for acquiring knowledge since the needs of new-generation students have evolved and are no longer satisfied with the traditional teacher-centered approach. Nowadays, for learning English or other languages, students turn to apps based on gamification such as Duolingo, Busuu, Babbel, and Memrise, which provide categorized, bite-sized lessons. Students are increasingly drawn to mobile applications for language learning due to several noteworthy factors. Firstly, these apps offer unparalleled accessibility as they can be easily accessed on smartphones, which are commonly owned by most students. Secondly, the apps employ an entertaining and engaging format, incorporating multimedia-integrated tasks that enhance the learning experience. Additionally, the convenience of being able to learn anytime and anywhere is a compelling aspect of these mobile applications. Finally, students value the chance to generate and exchange content with their peers, expanding the learning experience beyond the boundaries of the conventional classroom environment (Haliem, 2018).

Gamification is a popular concept that has spread to many areas of human activity, including information and communications technology, medicine, marketing, education, and business. As Caponetto (2014) explains, gamification involves the integration of elements typically found in games into non-gaming contexts to influence behavior, increase motivation, and encourage greater participation. The term is gaining popularity in the Balkan region and is increasingly used in academic research, as well as in educational and business contexts. Therefore, this research examines how the use of gamification increases learners' motivation to learn English, influences their academic performance, and improves their language skills.

1.1. Theoretical Background

Second language acquisition has become one of the greatest necessities in a modern interconnected world. Bilingualism is gradually becoming the norm and, in 2021, it was estimated that 43% of the global population is bilingual, while an additional 17% is multilingual (Gration, 2022). This encompasses a majority of the global population. The study conducted by Lee and Hammer (2011) has provided compelling evidence indicating that low motivation stands out as one of the prevalent challenges encountered by learners. Prensky (2011) argues that with the changing times, the manner in which learners study and the primary means of input are changing, which has an impact on motivation. Consequently, games, as a form of entertainment, present fertile ground for knowledge transmission and have been doing so for a long time (Rego, 2015).

1.1.1 Fundamental Concepts of Gamification and Game-based Learning in Educational Settings

Deterding et al. (2011) have defined gamification as the implementation of game design elements in contexts that are not games per se. Similarly, Sheldon (2020) supports this perspective, noting that gamification involves the integration of game mechanics into real-world activities. Bedwell et al. (2012) proposed a categorization of nine game attributes that Landers (2014) modified to make them applicable in the learning context. These attributes include storyline, evaluation, conflict/challenge, control, environment, game fiction, human interaction, immersion, and rules or goals (Bedwell et al., 2012). Nuez Castellar et al. (2016) present game-based learning as a vehicle for the learning process and distinguish between two types. The first type is the deliberate development of games for educational purposes, the second type is the adaptation of originally entertainment-based games for learning contexts. Game-based learning differs from

gamification in that it offers its own learning space, while gamification facilitates the learning process and increases motivation.

Due to the inherently competitive human nature, games provide a sense of fulfillment by offering rewards such as points, titles, advancement to higher and more challenging levels, and recognition (Werbach & Hunter, 2012). In the field of language learning, gamification is crucial element in facilitating language practice and knowledge acquiring through the use of language learning applications. Available on any mobile device with internet access, these applications offer a free way to learn vocabulary, grammar, writing and/or pronunciation in various foreign languages anytime, anywhere, and make learning motivating and fun through the use of gamification. A great example of this is Duolingo, an application that has taken the world by storm. Duolingo and other similar applications based on gamification provide a space for so-called edutainment, where through games learners can acquire skills that can be applied to problems in real-world context (Lee & Hammer, 2011).

Werbach and Hunter (2012) conducted comprehensive research on the topic of gamification, wherein they provided an extensive definition of the concept. They described gamification as the implementation and utilization of game principles in real-life situations for the purpose of problem-solving. According to their research, elements of the game can be divided into three distinct categories: components, dynamics, and mechanics. The *components* category encompasses various elements found in games, such as levels, avatars, badges, quests, unlocking mechanisms, visual representations (graphs), teams, and similar features (Werbach et al., 2012). *Dynamics*, as described by Werbach and Hunter (2012), involve the intricate abstractions that exist within a game. This includes elements such as the narrative structure, limitations imposed on the players, and the progression system that drives the game forward. The *mechanics* aspect refers to the interactive processes that engage users. It includes elements such as rewards, feedback mechanisms, the number of attempts allowed collaboration with other users, and the presence of challenges (Werbach et al., 2012). Werbach and Hunter's research provides valuable insights into the multifaceted nature of gamification, offering a comprehensive understanding of its key elements, dynamics, and mechanics.

Kapp (2012) goes further and proposes game aspects that are specifically crucial in the context of education, and he categorizes them as:

- *mechanics* - includes points, rewards and statuses that can be improved,
- *aesthetics* – includes the appeal of the interface,
- *game thinking* – applying competitiveness to daily situations.

Points are a form of reward that adopt the same role as money in a real-life context, so they are a virtual currency that a player earns by spending more time and effort on playing, thus making greater achievements (Kim, 2015). *Badges* are also virtual rewards that motivate the player by reflecting the level of success in completing tasks in the game (Thornbury, 2005). *Levels* are virtual ranks that reflect the progress of skill, mastery, and knowledge of the player, so they serve to reflect their growth in abilities and it promotes competitiveness (Kim, 2015). *Leaderboards* are digital lists of players sorted by level of achievement in the form of scores to shape a competitive environment (Thornbury, 2005)

1.1.2 Gamification and the Psychology of Learning

These game elements and gamification as a general concept are tied to and based on child psychology. Games are a process for children to explore various roles and develop new perspectives. Most importantly, children acquire knowledge or learn through play. In this regard, a child should have opportunities for unrestricted play so as to recognize ambitions and sensations (Đurić, 2022), which is necessary for his/her general development – social, cognitive, sensi-motor and so on (Rajić & Petrović-Sočo, 2015). Consequently, learning through play is instilled in human psychology from early stages. It is for this reason that play is so important and it is a crucial aspect to incorporate into the educational context and allow children and adults to nurture this natural model of acquiring knowledge through enjoyable experiences tailored to their needs (Đurić, 2022).

In Werbach and Hunter's (2012) research, they highlighted the importance of two forms of motivation in foreign language learning: intrinsic motivation and extrinsic motivation. Intrinsic mo-

tivation is considered the internal drive that arises from the inherent rewards associated with an activity, such as personal enjoyment, learning, or a sense of achievement. On the other hand, extrinsic motivation occurs when individuals participate in an activity to attain rewards or avoid punishment (Lepper, 1988). Gamification leverages game elements to address both types of motivation. For instance, features like levels, points, and badges can serve as extrinsic motivators, encouraging learners through rewards and recognition. At the same time, feelings of accomplishment, autonomy, and mastery within the game context inspire intrinsic motivation among learners (Werbach and Hunter, 2012). By incorporating these aspects, gamification caters to both intrinsic and extrinsic motivations, fostering a holistic motivational environment for language learners.

1.1.3 Barriers and Opportunities in Complex Digital Transformation of Education

The widespread adoption of games as an educational tool faces a significant obstacle, namely the resistance from teachers and parents who associate gaming with potential violence and addictive behaviors (Elson & Ferguson, 2014). This perception poses a challenge to the integration of games into educational settings. However, computer and mobile games can be adjusted for teaching purposes in a manner that boosts creativity, understanding, initiative-taking, and productivity, and strengthens motivation for students to continue their studies at home. Lee and Hammer (2011) highlight the potential of gamification as a powerful tool for motivating learner engagement within educational environments. They argue that gamification offers educators enhanced resources to provide scaffolding and reward students' learning efforts, ultimately fostering deep learning experiences. Through the utilization of gamification principles, educators have the opportunity to construct a learning environment that is not only captivating but also fosters active engagement and facilitates the acquisition of meaningful learning outcomes.

1.1.4 Gamification for Enhanced Learning of English as a Foreign Language

The results of many studies show that gamification can improve the process of acquiring English skills (Kriyakova, Yordanova and Angelova, 2014). These studies provide evidence and arguments that highlight the positive impact of gamification on the process of language learning. English learning is often perceived as uninteresting and challenging for foreign learners in non-gaming contexts, and it is more engaging through gamification. In his comprehensive report The Advantages of Gamification in the English Learning Context (2020), Rahmani studied a number of studies consistent with the advantages of Gamification in the acquisition of English. The results of these studies consistently show that gamification has a favourable impact on English learning results. Despite differences in participant preferences and learning contexts, these studies consistently identified four main advantages of gamification: increased motivation, improved attitudes and performance, cultivation of 21st-century skills and cognitive achievement, and improvements in social interaction, independence and competitiveness. These advantages are constantly observed in various studies, underscoring the positive impact of gamification in these important areas of English learning.

Research by Al-Falqani (2019), Lin, Ganapathy, Kaur (2018), and Mufida (2016) consistently shows that English proficiency in high and low-level learners is not significant when playing gamified activities. Gamification promotes active student participation and increased use of English, creating an inclusive, fear-free learning environment, and was found to increase the use of English, as reported by Flores (2015), Mufida (2016), and Lam (2016). The integration of badges into game activities promotes social interaction and healthy competition between students, thereby improving social competence, improving English language abilities (including grammar, vocabulary, fluency, pronunciation, speed and conversation) and using technology for learning. These conclusions were supported by research by Flores (2015), Mufida (2016), Lam (2016), Mikasyte (2018), Boyinbode (2018), Lin, Ganapathy, Kaur (2018) and Dehghanzadeh. (2019) and Alfulaih (2019). The implementation of gamification in English classrooms offers a promising solution to combat the ineffective and passive learning environment and provides students with more engaging and meaningful experiences. Successful integration of gamification strategies into these classrooms leads to an active learning atmosphere, active student involvement, improved English skills (especially in speaking) and improved cognitive performance, as evidenced by higher scores in the above-mentioned studies.

2. Literature Review

2.1 Gamification and Motivation

The central element of gamification lies in the user's motivation, which plays a crucial role in determining their performance within the application. Zichermann and Cunningham (2011) emphasize entertainment as one of the primary drivers and reasons for the extensive engagement with video games. Psychologists have extensively studied video games as a source of motivation for decades, which has led to a significant interest in their application in educational and other contexts (Ramirez & Squire, 2015). Prensky (2011) proposes that by leveraging the motivational influence of games and integrating it into educational contexts, learning experiences can become more efficient. Through the integration of gamification, the negative connotation of failure in the learning process is reframed as a constructive and valuable experience. Instead of feeling helpless, anxious, or overwhelmed, students perceive failure as a new opportunity for growth and improvement. This shift in perspective enables students to embrace challenges and view setbacks as steppingstones towards progress and success.

Felicia (2009) also revises about how motivating computer educational games are, stating that it is one of the main qualities of computer games since they contain a variety of auditory, tactile, visual and intellectual stimuli, which actually make the game more interesting and addictive. According to the researcher, the incorporation of multimedia content within games results in increased concentration and focus among players, compelling them to employ their abilities to achieve the objectives set forth in the game. By incorporating diverse forms of multimedia such as visuals, audio, and interactive elements, games captivate players' attention and encourage them to actively engage with the game mechanics to achieve their goals. This immersive and interactive experience facilitates the utilization and development of various skills by the players. In this regard, motivation it is possible to achieve different factors, depending on the student's personality, aspirations, interests, complexity of the game, and so on (Felicia, 2009).

As Skender and Karas (2017) state, due to this way of choosing games, students are more concentrated and more active in teaching compared to other forms of learning. The game is one of the easiest ways to bring the teaching content closer to the students, which is adjusted to their interests and intellectual abilities. Several researchers and studies found that for successful teaching, it is necessary to methodically and creatively design games that will be adapted to the age, abilities, and interests, but also games that will be focused on the teaching content and achieving the goals of teaching (Deterding et al., 2011; Pipo, 2021).

Applications may speed up feedback processes by providing students with timely responses to maintain their continuous engagement (Lee & Hammer, 2011). This timely feedback enables students to evaluate their own abilities and progress, creating an environment where effort is rewarding rather than focusing solely on competence. As a result, the pressure associated with learning processes has been reduced. Figueroa-Flores (2015) argues that the integration of gamification activities leads to greater student engagement. Such activities are seen as exciting challenges for students to overcome. Challenges in gaming serve as motivators for students and encourage active participation and effort in learning processes (Figueroa-Flores, 2015). This increased engagement contributes to a more dynamic and interactive learning environment. According to Huang and Soman (2013), the majority of students prefer interactive learning because it allows them to acquire knowledge on their own time and tempo, thereby eliminating traditional educational pressures.

However, Yanes and Bououd (2019) discovered through their research that a minority of students perceive gamified environments as childish and immature. Some students also indicated that although game-based activities may improve their competitive spirit, they do not necessarily contribute to a deeper understanding of the importance of learning. Gamification is considered to be a valuable tool for enhancing motivation and supporting language learning, but it is recognized that games are valuable tools for improving motivation and support language learning, Lee and Hammer (2011) argue that it should be regarded as an additional resource rather than a substitute for traditional learning methods. This perspective aligns with Brown's (1994) assertion regarding the crucial role of motivation in foreign language acquisition. Figueroa Flores (2015) further highlights the potential of gamification to increase student motivation. Furthermore, Ybarra and Green (2003) emphasize the advantages of incorporating technology tools into the learning of second languages and emphasize the importance of technology to improve effective language learning. In short, while games

may not be favourable to all students, they should be considered as complementary approaches, and in combination with suitable technology resources, they can be useful tools to increase motivation and support language learning.

According to Rajendran and Shah (2020), gamification elements in education cater to students' needs and enhance their motivation, creating a healthy competitive environment for learning. Hashim et al. (2019) emphasize that students' interest in playing games positively impacts their self-esteem and confidence in learning grammar. In the context of autonomous learning, Anisa et al. (2020) emphasize that gamification promotes students' intrinsic and extrinsic motivation, leading to increased participation and autonomy in their learning journey. Language-focused games provide a non-threatening and enjoyable environment for vocabulary acquisition, allowing shy and slower learners to progress at their own pace while autonomously exploring word meanings using dictionaries, as discussed by Letchumanan et al. (2015).

Lee (2016) argues that incorporating games in the classroom offers benefits when considering learners' cultural perspectives. Ortega-Dela Cruz (2020) asserts that the incorporation of new gamification elements facilitates learners' self-evaluation and autonomy, enabling them to cultivate a more profound understanding of the learning process. Matsumoto (2016) emphasizes that game-based content sustains learner motivation and fosters creativeness. The utilization of gamification, particularly through information and communication technology (ICT) tools, allows highly motivated learners to effectively acquire English language skills (Azar & Tan, 2020). Lam et al. (2011) emphasize the importance of instant feedback in gamified learning environments, providing students with valuable learning opportunities.

Rafiq et al. (2019) indicate that students have highly positive perceptions of language learning games, perceiving them as engaging and motivating, boosting their self-esteem and overall learning. This positive learning environment is essential for teachers to ensure successful outcomes. Müller et al. (2015) conclude that gamification enhances student involvment and facilitates the growth of socio-economic aspects as well as both, personal, along with technical competencies.

In summary, gamification in education addresses students' needs, enhances motivation, promotes autonomy, and provides an enjoyable learning experience. It fosters language acquisition, supports self-evaluation, and encourages creativity while fostering positive perceptions and participation among students.

2.2 Principles of Gamification and Psychology of Motivation

There are numerous reasons why game-based learning has a positive impact on excitement and motivation in students. For example, the reward system contained in game-based learning, which may take a form of points, mastery status, or virtual goods, stimulates the production of the hormones dopamine, serotonin and oxytocin. Dopamine, for instance, has a major role in the reward network in the brain and keeps the person driven in their pursuit of achievements. When the production of these „happy hormones" stop, the person feels the need to reach that state of being repeatedly, thus they are motivated to continuously engage in the activities that elicit those sensations. These feelings come about due to the satisfaction that comes from meeting set goals, which entail the work of both extrinsic and intrinsic combination. Csikszentmihalyi (1998) proposes that flow theory posits two key factors that contribute to the experience of happiness: concentration (or immersion) and absorption in the activity. It is argued that for the achievement of such as state, an equilibrium needs to exist between the person's ability and the level of difficulty of the given challenge.

Vygotsky's (1978) theory of cognitive sociocultural development introduced the concept of the Zone of Proximal Development (ZPD), which represents the difference between the current developmental level and the potential developmental level of a person. In order to promote learning, this gap must be bridged through cooperation and the use of existing resources, including technological tools such as language learning games. A task must be within the range of cognitive growth capabilities that need a certain level of motivation to achieve. In terms of gamification, it aims to increase intrinsic motivation through socialization, autonomy, and self-control improvement (Gregory, 2015). Language learning games can be a technological resource that provides scaffolding and support to learners within the ZPD.

The past few years, a significant increase in interest regarding the use of gamification in English vocabulary learning has been recorded by numer-

ous research. Multiple studies have demonstrated that this approach to learning enhances motivation and engagement among learners (Hurtado & Medina, 2017; Castro-Garces & Guaquate, 2017; Hasegawa et al., 2015; Walsh & Abrams, 2014; Sun & Hsieh, 2018). The positive influence of games on motivation and engagement can be attributed to the use of reward systems within these learning environments. Typically, these systems involve implementing scoring systems and recognition symbols like badges or titles such as "master" or "legend." These prizes create a sense of achievement and promote strong motivation to continue learning vocabulary (Castro-Garces & Guaqueta, 2018; Walsh & Abrams, 2014; Hasegawa et al., 2015). According to Gee (2009), digital games offer problem-solving environments that promote continuous learning, mastery, and enjoyment. By incorporating game elements into vocabulary learning, learners are immersed in captivating and pleasurable experiences that foster active engagement and the cultivation of problem-solving abilities.

The integration of game mechanics, including systems of rewards, with the process of vocabulary learning generates a dynamic and interactive educational setting.. Gamification transforms the learning process into an enjoyable and goal-oriented experience, allowing learners to develop their vocabulary skills while experiencing a sense of entertainment and pleasure. Such a form of learning can be used for forming a stronger and deeper understanding of concepts and, thus, solving problems. However, in research done by Abramović et al. (2013) it is discussed how badges in games have both a negative and positive potential in terms of effects on learning, depending on the situation and the student, recommending a careful application of such mechanism in the classroom context, with high consideration of pedagogical approaches as to prevent distraction from core activities in the class (e.g. students focusing on collecting scores more than developing skills). To prevent negative effects educators may apply activities that require finding alternative solutions, resource-management, and collaboration to compensate for low level of skill.

Smiderle et al. conducted a study with 40 undergraduate students on how points, ranking and badges affect engagement and learning based on student personality. They divided the groups and allocated each to a gamified or non-gamified program. The results revealed behavioral changes in the gamified group, showing that students with less agreeable, less open, and introverted personality traits who used the gamified version later in the course had better accuracy (Smiderle et al., 2020). The study yielded intriguing results concerning the influence of gamification on various student profiles. The study observed a decrease in accuracy during semester among low-conscientious students in the non-gamified system. However, this decline in accuracy was not observed in the gamified group, suggesting that gamification helped maintain performance levels among these students.

Additionally, the study found that introverted students using the gamified version exhibited more positive attitudes compared to extroverted students using the same version. This indicates that the gamified approach was particularly beneficial for introverted individuals, enhancing their engagement and satisfaction with the learning process. Furthermore, the research identified a strong negative correlation between extraversion traits and the number of ranking views. This suggests that extraverted students may not derive as much benefit from ranking elements within the gamified system compared to introverted students. The results shed light on the varied outcomes of gamification across diverse student profiles, adding to our knowledge of how gamification can be customized to accommodate individual learner traits and preferences. These findings offer important views in the design and implementation of games in educational settings.

2.3 Internet Usage Patterns, Gender, Academic Performance, Attitudes Towards Blended, Online, and In-Person Learning, and English as a Foreign Language Acquisition by Students

Bećirović and Dervić (2022) conducted a study which revealed a significant correlation between Internet habits, satisfaction, tech-related anxiety, readiness for e-learning, and their interest for hybrid or online, and face-to-face learning. These preferences, in turn, have an influence on students' GPA. The study emphasizes the importance of taking into account students' individual characteristics and attitudes towards technology when designing learning environments to optimize their educational outcomes. Bećirović et al. (2022) discovered that factors such as online time and gender have a notable impact on students' satisfaction with online learning. Nevertheless, the research also indicated that a majority of students demonstrate a high level of self-assurance in their

ability to utilize the Internet proficiently and actively engage in self-directed learning. These findings provide support for the incorporation of online tools and gamification in indoor settings, as students' perceived competence in using technology and their inclination towards self-directed studying can be leveraged to enhance their experience of learning as a process. In this study, interestingly, it was found that males report higher satisfaction than females. Additionally, the study revealed that students with higher GPAs tend to have higher levels of satisfaction with online learning compared to students with lower grades. Moreover, students who spend more time utilizing devices, online tools, and the Internet reported a greater sense of self-efficacy and self-regulation.

These findings suggest that students who are more academically successful and actively engage with digital resources have a more positive perception of online learning and demonstrate greater confidence in their ability to manage their learning effectively. Dautbašić and Bećirović (2022) argue that online teaching will soon become the most used method of knowledge transference that will allow learning to become resistant to crises such as the COVID-19 pandemic, ensuring that generations to come will always have an opportunity for self-improvement. However, they argue that the educational system will not be able to make a shift from analogue to digital-only in terms of content, thus some principles from the traditional system will have to remain – such as a lecturer and curriculum.

In a separate quantitative investigation carried out by Bećirović et al. (2022), the main objective is to study the impact of teacher support on the acquisition of English as a foreign language by students in secondary schools in Bosnia and Herzegovina. The findings of the study showed that students had a positive experience in technology-assisted learning and that teachers' support played an important role in facilitating the learning process. In addition, the relationship between motivation and achievement in English as a foreign language learning was examined in a previous study conducted by Bećirović and Hurić-Bećirović with 185 students. The results of the study showed that female students were more likely to be proficient in English than male students.

2.4 Enhancing Listening Proficiency in English Language Acquisition

Listening is a core aspect of language learning and based on human developmental stages, it is a predecessor of speech development. Mee (2017) defines listening as a process of perception that involves paying attention, becoming conscious, and selectively engaging with environmental signals. His research also considers hearing and auditing as key factors in listening. Hearing which entails the physiological sound-detection ability, sound distinction and blending, as well as sequential retention of sound in memory. Auding refers to the process of meaning-making, imagining and organizing input information in the mind. Effective language learning relies on listening, which builds comprehension, vocabulary, and grammar skills for successful communication. Field (2010) further emphasizes that incorporating abundant listening practice within the classroom and utilizing effective listening strategies by teachers significantly contribute to achieving a high level of success in language learning. Snowling (2016) proposed the main factors dictating the scale of difficulty in oral tasks:

1. Speaker (Number of speakers, speech pace, accents)
2. Listener (role in interaction, response requirement, interest in the conversation topic)
3. Content (grammar, vocabulary, information structure, prior knowledge)
4. Supporting media (diagrams, images, videos and other)

According to Sayfli et al. (2020), meeting the diverse listening skill needs of English language learners poses a significant challenge for teachers. This refers to differences in sound recognition and processing, selectivity in listening, and their ability to follow the pace of information exchange, among other aspects. In this sense, games with customizable options for improving ELL listening skills can prove highly valuable for overcoming the challenges presented in the aforementioned sections.

2.5 Speaking Skills in English Language Learning

Making the connection between listening and speaking skills, the latter can be defined as

the application of acquired sound-pattern recognition through purposeful formation of speech with the aim of conveying meaning. Speaking, the ability to construct proper syntax and use appropriate vocabulary for communication of thought, is considered as a gauge of language proficiency level based on which student success is approximated (Thornbury, 2005; Nunan, 1995). In speech production, there are two crucial aspects that affect the perceived level of mastery: pronunciation and speed rate. Pronunciation is connected to phonology and the awareness related to rules of accurate spelling interpretation and sound production, while speed rate signifies the ability to recognize the appropriateness of pacing with regards to recipient capabilities for speech input processing. In this sense, the learner observes progress through feedback provided by the recipient about outputted information (Kaur & Abdul Aziz, 2020). Games are useful tools for speech practice that allow the elimination of potential blockers in learning such as discomfort experienced in public expression due to negative perception of error occurrences or divergence in learning speed (the need for repetition and additional practice). Users are provided a safe space for repeated practice and improvement, and autonomous learning. Posada and Francis (2012) found that the application of gamification in ELL classes boosts motivation for English language learning and speech production.

2.6 Reading Skills in English Language Learning

Reading is a cognitive activity dependent on the ability of decoding textual content based on background knowledge and experience, for the purpose of deriving and understanding meaning (Hashemi, 2021). Comprehension is an inseparable component in reading, as it entails active engagement in acquiring information, meaning-making, and context interpretation that results in mind growth (Mzayaki, 2019). Hashemi's research (2021) uncovered that games significantly improve vocabulary learning and motivation for English language learning due to the factor of enjoyment offered through gamification. Moreover, with regards to reading comprehension, games were found to be more impactful in the classroom than traditional teaching and learning methods. Games prompted higher engagement level among students and, in turn, input repetition cycles increased in frequency when games were employed in teaching practice. Derakhshan and Davoodi Khatir (2015) as well as Ebrahimzadeh and Alavi (2016) discovered that games have a positive influence on student motivation and promote increased engagement in vocabulary learning.

2.7 Writing Skills in English Language Learning

Writing entails the cognitive activity of ideation and mental syntax construction expressed through symbols forming sentences and statements for the purpose of communication. In language learning writing is a core skill required for language mastery. In his research, Bing (2013) found that action-adventure games allow student to implicitly learn and improve narrative writing skills. He demonstrated the potential of games to be used as pseudo-classrooms for immersive learning that helps students to tie learning material with experiences. This study also provided reason to question the need for reliance on explicit theoretical teaching over the integration of implicit components that provide a low-pressure approach to learning English writing skills, and that enable a more natural or optimum model for ELL.

3. Methodology

The aim of this study is to investigate the impact of gaming on the motivation and academic performance of students in the context of the teaching of English at the Higher Education level in Bosnia and Herzegovina. Previous research into gamification in learning English has yielded varying results, depending on the region. Since similar studies were not conducted in Bosnia and Herzegovina, alternative variables were investigated. The research question is: Does playing games influence the motivation and performance of students to learn English as a foreign language?

The hypotheses aim to obtain a holistic answer to the research question, and are as follows:

H1: There is an influence of games on student motivation to learn English as a foreign language.

H2: Playing games will influence student EFL learning outcomes.

H3: Using games will influence English listening skills.

H4: Using games will influence English speaking skills.

H5: Using games will influence English reading and writing skills.

H6: Student listening, speaking, reading and writing EFL skills obtained by playing games predict student EFL achievement.

The variables studied in this research include the English-language proficiency of students (measured by the GPA), the level of motivation, the influence of games on learning results, and the development of skills in listening, speaking, reading, and writing.

3.1 Participants

The study included students enrolled in public and private universities in the higher education system in Bosnia and Herzegovina. The sampling method used was a logical and snowball sampling method. The aim was to reach 200 participants and to ensure that men and women participated at the same age and social status. The objective of sample size is to have a variety of age groups, socio-economic status, level of English knowledge, GPA, area of study, and year of study.

The sample size is 202, thus it is big enough for listed types of tests. There were no missing data points in data processing. Gender representation in the sample is overall equally distributed. Out of the 202 participants, 50.5% are male and 49.5% female. The majority of surveyers, 61.4%, are between 29 – 39 years old, while 15.8% and 14.4% are between 40 and 50 or over 50 years old, respectively. The smallest percentage group in the sample are learners between 18 and 28, which make up 8.4%. The participants' academic background includes PhD and Doctorate students, as well as those enrolled in Master and Bachelor studies. Fields of study represented are: English and Literature, Information Technologies, Engineering, Natural Sciences, Economic and International Relations/Political studies.

When it comes to the level of English in the sample, most participants have a B1 or B2 level of proficiency, making up 71% and 65% of the sample, respectively. In third place, the most represented level of proficiency are C1 and C2, with 34%. The least present levels of English proficiency in the sample are A1 and A2, with 32%. The GPA level was categorized into three groups: low, moderate, and high. The largest portion of the sample, 62.9%, falls into the moderate GPA category, while the high GPA category accounts for 35.6% of the participants. Only 1.5% are in the low GPA category. When it comes to student academic performance in English, participants could rate it on a scale between "acceptable" and "excellent". The majority reported their performance as "very good', making 35.6% of the sample. The second and third most represented groups in the sample are those with "good" and "satisfactory" level of academic performance, with 28.7% and 18.8% respectively. 9.4% are in the top end of the scale, while 7.4% are in the bottom end.

The table below displays the demographic characteristics of the sample population, including information on gender, age, English proficiency level, GPA, and academic performance in English.

Table 1.
Demographic Characteristics of the Population Sample

		N	%
Gender	Male	102	50.5
	Female	100	49.5
Age	18 - 28	17	8.4
	29 - 39	124	61.4
	40 - 50	32	15.8
	50+	29	14.4
English proficiency level	A1&A2	32	15.8
	B1	71	35.1
	B2	65	32.2
	C1&C2	34	16.8
GPA	low	3	1.5
	moderate	127	62.9
	high	72	35.6
Academic performance (English classes)	Excellent	19	9.4
	Very good	72	35.6
	Good	58	28.7
	Satisfactory	38	18.8
	Acceptable	15	7.4

3.2 Instrument and Procedure

In order to collect data on students' motivation and achievement in learning English as a foreign language, a questionnaire of 57 questions was used. The questionnaire used a Likert scale of 5 points where participants could choose one of the five statements ranging from 5 (strongly agreed) to 1 (strongly opposed). The questions related to listening, speaking, reading, and writing skills in English (5 items each) were adapted from research by Ke Sin and Said (2020). Questions about motivation (24 items) and learning outcomes (4 items) were adapted from the Pratama 2020 study on student perception of game play to improve classroom participation and motivation in higher education. In addition, there were three questions about the academic performance of English (return) and the frequency of game use. The other four questions collected demographic information from participants.

The questionnaire was distributed using an online survey instrument (Google Forms) which was distributed via email, social media (Facebook, LinkedIn, and Instagram) and communication platforms such as Viber, WhatsApp, Signal, and Gmail, to students in higher education in universities across Bosnia and Herzegovina.

3.3 Normality

This research included a sample size of over 200 participants. The results of the Kolmogorov-Smirnov test showed that the sample did not follow a normal distribution ($p < 0.05$). However, with a large sample size, we can still apply parametric statistical analysis based on the Central Limit Theorem. The Central Limit Theory states that a large enough sample of random subjects from the general population will follow a normal distribution. The normality in this case approaches the real arrangement from nature and the sample is complete, meaning there are no missing data points, thus normality is 100% achieved.

3.4 Reliability

Using the Cronbach's Alpha test, the validity and reliability of the measurement scales used in this study were evaluated. Higher values denote greater reliability. The Cronbach's Alpha coefficient measures the internal consistency of a set of statements and ranges from 0 to 1. According to Kline's (1998) recommendations, coefficients around 0.9 are excellent, around 0.8 are very good, and around 0.7 are acceptable for reliability. In contrast, coefficients below 0.5 denote a significant level of random error, making the variables unreliable for further investigation. The Cronbach's Alpha coefficients for each variable are shown in the above table to aid in data interpretation and analysis. The variables covered in the following text are made up of groups of questions arranged according to the questionnaire's structure, each of which addresses a different aspect of the topic. Each variable's responses to the questions were added up, the total was divided by the number of questions, the result was rounded, and the same coding was applied to the result to determine the coefficients.

Table 2.
Test of Normality

Tests of normality						
Variable	Kolmogorov-smirnov[a]			Shapiro-wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Academic performance in English	0.218	202	0.000	0.903	202	0.000
Frequency of game use for English learning	0.227	202	0.000	0.862	202	0.000
Frequency of game use for English learning on a weekly basis	0.232	202	0.000	0.836	202	0.000
Frequency of game use for English learning on a daily basis	0.292	202	0.000	0.772	202	0.000
Motivation	0.285	202	0.000	0.806	202	0.000
Listening	0.321	202	0.000	0.747	202	0.000
Speaking	0.303	202	0.000	0.814	202	0.000
Reading	0.274	202	0.000	0.800	202	0.000
Writing	0.190	202	0.000	0.893	202	0.000
Perception	0.229	202	0.000	0.825	202	0.000

Table 3.
Level of Reliability of Variables (Cronbach Alpha Coefficient)

Reliability statistics			
Scale	Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
Motivation	0,934	0,947	6
Listening	1,000	1,000	2
Speaking	0,859	0,874	2

Reading	0,918	0,922	3
Writing	0,834	0,835	2
Perception	0,802	0,821	2

Table 4.
Cronbach Alpha internal consistency table

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

The reliability test demonstrated that there is an overall excellent internal consistency, thus the measurement is considered as reliable and can be further analyzed.

3.5 Data Analysis

The research data was organized and stored in MS Excel 2013 for further statistical analysis. IBM SPSS Statistics v25.0 was utilized for data processing. The research findings are presented in both tabular and graphical formats, providing a comprehensive representation of the results. The following statistical procedures were used:

1. Descriptive statistics for the purpose of calculating the mean and standard deviations
2. Testing of normal distribution
3. Pearson coefficient for correlation testing
4. Cronbach Alpha for testing interconnections between factors
5. Linear regression

4. Results

4.1 Initial Analysis

4.1.1 Descriptive Results

The descriptive statistics conducted on the collected data from the research sample reveal that the average frequency of game use for English language learning falls within a moderate range, indicating neither excessively high nor low usage. Thus, the majority of students do not exclusively use games for learning, but they do utilize them as helper tools in the learning process. When it comes to academic performance, the average student reported a higher level of achievement in English, leaning towards greater English proficiency. When it comes to the perceived effect of games on LSRW skills, on average, students report a significant impact.

Table 5.
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Academic performance in English	202	1	5	2.79	1.086
Motivation	202	1	5	1.97	1.076
Listening	202	1	5	1.89	1.189
Speaking	202	1	5	2.37	1.216
Reading	202	1	4	1.82	.902
Writing	202	1	5	2.68	1.197
Frequency of playing games	202	1.33	4.00	2.7723	.66489

4.1.2 Pearson correlation

The Pearson correlation test evaluates the direction and strength of a relationship between two variables. It determines a correlation coefficient that ranges from -1 to +1 and represents the strength of the correlation. The guidelines in the table below should be used to interpret the correlation coefficient.

Table 6.
Interpretation of Pearson Correlation Coefficient (Colton, 1874)

Interpretation of Pearson correlation coefficient		
	Value range	**Interpretation**
r	0 to ± 0,25	No correlation
	± 0,26 to ± 0,50	Weak correlation
	± 0,51 to ± 0,75	Moderate correlation
	± 0,76 to ± 1	Strong correlation
	± 1	Mathematical correlation

Table 7.
Pearson Correlations Between Variables

Correlations

		Level of academic performance in english	Frequency of game use for EL	Frequency of game use for EL(weekly)	Frequency of game use for EL (daily)	Motivation	Listening	Speaking	Reading	Writing	Perception
Level of academic performance in English	Pearson Correlation	1	-0.023	-,169*	,249**	0.104	0.043	0.029	0.013	-0.006	-0.108
	Sig. (2-tailed)		0.742	0.016	0.000	0.139	0.542	0.686	0.857	0.935	0.127
	N	202	202	202	202	202	202	202	202	202	202
Frequency of game use for EL	Pearson Correlation	-0.023	1	,540**	0.090	0.077	,179*	-0.096	0.034	,173*	0.027
	Sig. (2-tailed)	0.742		0.000	0.200	0.275	0.011	0.176	0.628	0.014	0.706
	N	202	202	202	202	202	202	202	202	202	202
Frequency of game use for EL (weekly)	Pearson Correlation	-,169*	,540**	1	-0.027	,398**	,312**	0.129	,155*	,298**	,376**
	Sig. (2-tailed)	0.016	0.000		0.702	0.000	0.000	0.067	0.028	0.000	0.000
	N	202	202	202	202	202	202	202	202	202	202
Frequency of game use for EL (daily)	Pearson Correlation	,249**	0.090	-0.027	1	,332**	,263**	,248**	,254**	,323**	,248**
	Sig. (2-tailed)	0.000	0.200	0.702		0.000	0.000	0.000	0.000	0.000	0.000
	N	202	202	202	202	202	202	202	202	202	202
Motivation	Pearson Correlation	0.104	0.077	,398**	,332**	1	,708**	,786**	,711**	,810**	,670**
	Sig. (2-tailed)	0.139	0.275	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	N	202	202	202	202	202	202	202	202	202	202
Listening	Pearson Correlation	0.043	,179*	,312**	,263**	,708**	1	,583**	,653**	,739**	,536**
	Sig. (2-tailed)	0.542	0.011	0.000	0.000	0.000		0.000	0.000	0.000	0.000

Speaking	Pearson Correlation	0.029	-0.096	0.129	,248**	,786**	,583**	1	,850**	,824**	,815**
	Sig. (2-tailed)	0.686	0.176	0.067	0.000	0.000	0.000		0.000	0.000	0.000
	N	202	202	202	202	202	202	202	202	202	202
Reading	Pearson Correlation	0.013	0.034	,155*	,254**	,711**	,653**	,850**	1	,836**	,652**
	Sig. (2-tailed)	0.857	0.628	0.028	0.000	0.000	0.000	0.000		0.000	0.000
	N	202	202	202	202	202	202	202	202	202	202
Writing	Pearson Correlation	-0.006	,173*	,298**	,323**	,810**	,739**	,824**	,836**	1	,693**
	Sig. (2-tailed)	0.935	0.014	0.000	0.000	0.000	0.000	0.000	0.000		0.000
	N	202	202	202	202	202	202	202	202	202	202
Perception	Pearson Correlation	-0.108	0.027	,376**	,248**	,670**	,536**	,815**	,652**	,693**	1
	Sig. (2-tailed)	0.127	0.706	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	N	202	202	202	202	202	202	202	202	202	202

***. Correlation is significant at the 0.05 level (2-tailed).**

****. Correlation is significant at the 0.01 level (2-tailed).**

Based on the results of the Pearson correlation test presented in the table above, the following correlations were observed:

- There is a weak and significant positive/ negative correlation between the weekly frequency of game use and the level of performance in English.
- There is a weak and significant positive/ negative correlation between the daily frequency of game use and the level of performance in English.
- There is a weak and significant positive/ negative correlation between the frequency of game use and listening skills.
- There is a weak and significant positive/ negative correlation between the frequency of game use and writing skills.
- There is a strong and significant positive/ negative correlation between the frequency of game use and motivation.
- There is a moderate and significant positive/ negative correlation between the weekly frequency of game use and listening skills.
- There is a weak and significant positive/ negative correlation between the weekly frequency of game use and reading skills.

- There is a strong and significant positive/negative correlation between the weekly frequency of game use and the perception of the usefulness of games for EFL.
- There are moderate and significant positive/negative correlations between the daily frequency of game use and listening, speaking, reading, writing skills, and the perception of the usefulness of games for EFL.
- There are strong and significant positive/negative correlations between motivation, listening, speaking, reading, writing skills, and the perception of the usefulness of games for EFL.
- There are strong and significant positive/negative correlations between the perception of the usefulness of games for EFL and motivation, listening, reading, writing, and speaking skills.

Through the Pearson correlation coefficient test, we found that there are overall signficant relationships between variables, with the greatest number having either a weak or strong correlation.

4.1.3 Digital Media Use Habits of the Sample

The majority of students (87.1%) from both private and public universities in Bosnia and Herzegovina reported that they had not used digital media for active English language learning prior to 2022.In the past year, 35.6% reported that they often use games for ELL, 26.7% very often, 21.8% sometimes and 15.8% rarely. On a weekly basis, the greatest portion of the sample (36.1%) uses games for ELL up to 5 hours a day, while the second closest reported level of use is more than 10 hours weekly (33.2%). 20.8% of the sample uses ELL games between 5 and 10 hours weekly. Only 9.9% use games for ELL on an everyday basis. When participants use games for ELL, on a daily basis, the greatest percentage of the sample uses them between half an hour and two hours (46%). The second most common level of use is between three and five hours (32.7%) and then the lowest frequency is present in the group that uses ELL games for 6 hours or more (21.3%).

Table 8.
Mean and Standard Deviation of Responses on Prior Digital Media Use and User Habits

Variable	Mean	Standard deviation
Previous use of digital media for English language learning before 2022 (active)	1.13	0.336
Frequency of game use for ELL	3.73	1.026
Frequency of current use of games for ELL on a weekly basis	2.83	1.032
Approximate length of use of games for ELL on a daily basis	1.75	0.784

The table above displays the standard deviations and means of the variables concerning students' active utilization of digital media for English language learning before 2020 and their habits regarding the use of games for ELL. The data distribution of responses or values in the sample indicates a normal distribution without any outliers.

4.1.4 Student Attitudes and Motivation for Game-Based English Language Learning

Overall, when it comes to attitudes and motivation for using ELL games, the majority of participants have a positive attitude and evident motivation to use these learning tools (Table 1). 65.8% strongly agree with the claim that they look forward to playing games in ELL games, while 25.2% and 8.9% agree or slightly agree, respectively. 42.1% and 40.6% strongly agree or agree that they find ELL games interesting. Out of 202 responders, the majority also consider ELL games fun (strongly agree – 28.2%, agree 42.1%, slightly agree 22.8%). The most significant percentage of the sample finds connectivity issues frustrating when it comes to ELL games (27.2% strongly agree, 47% agree, and 19.3% slightly agree), which can have an impact on motivation to use them as a primary tool for learning. 6.4% disagree with that claim, but it should be noted that this percentage mostly consists of individuals who have reported that they do not use ELL games often. To questions of regarding participants' personal experience of using games is exciting, enjoyable, and positive, most offered top two positive answers. The questionnaire also included items regarding the manner in which participants use ELL games. These questions were included as a less obvious gauge of the level of motivation and en-

gagement that ELL games elicit in users. The questions concern the participants' level of focus, level and speed of response, and accuracy. To the claim that they focus on each item or question in modules on ELL games, the majority answered positively, but at varying degrees – 31.7% strongly agree, 44.6% agree, 23.8% slightly agree. When it comes to the level of response, the majority answered that they respond or try to respond to each question in a module (29.7% - strongly agree, 21.8% - agree and 28.2% slightly agree). Concerning speed and accuracy in responses to tasks in ELL games, the dominant responses indicate that surveyed users try to respond as quickly as possible to questions (4.5% - strongly agree, 59.9% - agree, and 21.8% - slightly agree) but concerning accuracy the statistics show more flexibility. 14.9% reported that they respond as accurately as possible to items and questions in modules on ELL games, while 20.8% agree and 37.1% agree slightly. 16.3% disagree with this claim and 10.9% strongly agree. The varying responses to this question can be attributed to several factors, which include the level of motivation to treat ELL games as an official learning tool, time-management challenges or time allocated for learning via ELL games, level of English proficiency, focus issues due to extraneous, mental or environmental, factors that may affect a user's repeated performance and their perception of it overall. Another aspect that affects motivation for English language learning through game-based applications is the element of competition that is an integral element in this type of a learning design. Questionnaire responses to the inquiry on whether users like competitiveness in ELL game sessions show that there is a preference for competitiveness. 36.1% strongly prefer this element in learning, 25.2% have a moderate and 38.6% a slight preference. 26.7% and 44.6% of participants strongly agree or moderately agree that they are motivated by winning in ELL game sessions. 3% slightly agree with this claim and in total 25.7% disagree that this aspect of ELL games is motivating in their learning process. Attention is a crucial ingredient without which learning cannot take place. When it comes to learning English through applications that contain competitive features, and their effects on attention, the responses of users indicate that their desire to win in competitions can boost attention devoted to learning English during game sessions (27.7% strongly agree, 29.1% slightly agree). However, 33.2% of participants disagree with this claim, which might be affected by personality types, learning styles, environmental influences and similar factors, which can be investigated through further research on this topic. In total, 88.6% of responders report being eager to learn English via ELL games. As a result, a significant majority (94%) of participants hold the belief that incorporating ELL games in teaching and learning within higher education holds value and should be integrated into the educational system. Interestingly, 82.6% of participants in the sample find English courses in ELL games difficult, to varying degrees, while 17.3% do not. The large percentage indicating challenges with the level of difficulty of ELL material on games is an interesting point for further research on the topic of gamification and English language learning to identify issue points and propose improvements that could compliment higher education goals. This questionnaire further reinforces the research that advocates for an integrated approach to English language teaching and learning, which combines digital, game-based, and traditional methodologies. In our research, we found that 88,2% believe that solely using ELL games for English language learning would eventually become boring, which implies that the current advantage of the effects that ELL games have on student motivation and attitude towards learning English could wither in case of oversaturation with similar content and teaching and learning methods. In total 89% of the student sample report that ELL games make them more excited in learning and 76,3% enjoy classes where ELL games are used. Although the perception of responders on whether ELL games increase activity in class is closely split between a positive and negative answer, the statistics show that 85% in total believe that these games help with building better relationships with other students and the teacher to some degree. In terms of the overall perception of online learning, the majority of students (70.3%) indicate that ELL games have played a significant role in cultivating a positive attitude towards online learning.

Table 9.
Motivation for Using ELL Games for Language Acquisition

		Percent					
		Q10: I look forward to playing in ELL games.	Q11: I find ELL games interesting.	Q12: I find ELL games fun.	Q13: I get annoyed when I can't connect to ELL games.	Q14: I feel excited when playing ELL games.	Q15: I enjoy playing ELL games.
Valid	Strongly agree	65.8	42.1	28.2	27.2	41.1	42.6
	Agree	25.2	40.6	42.1	47.0	40.1	43.1
	Slightly agree	8.9	10.9	22.8	19.3	13.9	14.4
	Disagree		3.5	5.0	6.4	5.0	
	Strongly disagree		3.0	2.0			
	Total	100.0	100.0	100.0	100.0	100.0	100.0
		Percent					
		Q16: I feel positive when playing ELL games.	Q17: I focus on the items or questions in each ELL game session.	Q18: I respond to each item or question in each ELL game session.	Q19: I respond as quickly as possible to each item or question in each ELL game session.	Q20: I respond as accurately as possible to each item or question in each ELL game session.	Q21: I like the competitiveness in our ELL game sessions.
Valid	Strongly agree	36.6	31.7	29.7	4.5	14.9	36.1
	Agree	32.2	44.6	21.8	59.9	20.8	25.2
	Slightly agree	20.8	23.8	28.2	21.8	37.1	38.6
	Disagree	6.9		13.9	4.5	16.3	
	Strongly disagree	3.5		6.4	9.4	10.9	
	Total	100.0	100.0	100.0	100.0	100.0	100.0
		Percent					
		Q22: I am motivated by the prospect of winning in ELL game sessions.	Q23: I pay more attention during lectures because I hope to win in ELL game sessions.	Q24: I am eager to learn via ELL games.	Q25: There is value in using ELL games for teaching and learning purposes.	Q26: ELL games should be used in higher education.	Q27: English course is so difficult on ELL games.
Valid	Strongly agree	26.7	27.7	18.3	66.8	66.8	66.8
	Agree	44.6		13.4	27.2	27.2	6.4
	Slightly agree	3.0	39.1	56.9			9.4
	Disagree	19.8	19.8	11.4	5.0	5.0	
	Strongly disagree	5.9	13.4		1.0	1.0	17.3
	Total	100.0	100.0	100.0	100.0	100.0	100.0
		Percent					
		Q28: I'd feel bored if I had class on ELL games almost every day.	Q29: I feel more active in the class with ELL games.	Q30: ELL games make me more excited in learning.	Q31: I enjoy the class with ELL games.	Q32: ELL games help me to have a better interaction with my classmates and the teacher.	Q33: ELL games have positively shaped my perception of online learning.
Valid	Strongly agree	12.4	32.2	32.2	32.2	13.9	42.1
	Agree	1.5	7.4	36.1	31.2	66.3	5.4
	Slightly agree	74.3	9.9	20.8	12.9	5.0	22.8
	Disagree	0.5	22.8	5.9	15.3	9.9	19.3
	Strongly disagree	11.4	27.7	5.0	8.4	5.0	10.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0

4.2 Hypothesis Testing

4.2.1 Weekly Frequency of Game Use on Motivation for EFL Learning

The first hypothesis, which claimed that the frequency of playing games would significantly affect students' motivation for learning EFL, was investigated using a linear regression analysis. The findings showed a statistically significant influence (F(1,200) = 32.929, p.

Table 10.
Model Summary for the Influence of Weekly Game Use on Motivation for EFL Learning

Model summary					
Model	R^2	Adj. R^2	SEE	F	Sig. F
1	0,718	0,699	0,567	32,929	,000

4.2.2 The Influence of Daily Game Use for EFL Learning on Academic Performance in English

The second hypothesis postulated that regular game play would significantly affect students' academic success in English as a foreign language. Hypothesis testing results showed a statistically significant influence (F(1,200) = 11.114, p.

Table 11.
Model Summary of the Influence of Daily Game Use for EFL Learning on Academic Performance in English

Model summary					
Model	R^2	Adj. R^2	SEE	F	Sig. F
1	0,454	0,413	0,601	11,114	,000

4.2.3 Effects of Playing Games on EFL Skills

The effect of ELL games on English speaking, listening, reading, and writing abilities is one of the hypotheses investigated in this study, which in turn influences learning outcomes. The sections that follow provide statistical information about how students from Bosnia and Herzegovina's private and public universities perceived the value and efficacy of ELL games in the context of English language learning.

4.2.4 Impact of English Language Learning Games on Listening Skills

In total, 84.7% of participants in the study reported that they feel that using ELL games helps to improve their English listening skills. Only 15.3% disagreed with this claim. Similarly, 87.2% reported greater confidence in and focus on English listening skills since using ELL games. Regarding the competitive elements of ELL games and their impact on student motivation to improve listening skills, a cumulative 77.7% of respondents expressed that scores, rewards, and leaderboards are effective in increasing their interest in English listening skills to varying degrees. Furthermore, when it comes to understanding the meanings of texts, the majority of students (80.2% cumulative) reported that they are able to comprehend the main idea of texts after using ELL games.

Hypothesis-testing results for the third assumption, which examines the influence of daily game use on listening skills in English as a foreign language, revealed statistically significant impact with a value of F=29.227 (p<0.001) (F(1,200)=29.227, p<0.001).

Table 12.
Model Summary for Impact of English Language Learning Games on Listening Skills

Model summary					
Model	R^2	Adj. R^2	SEE	F	Sig. F
1	0,128	0,123	1,114	29,227	,000

4.2.5 Impact of English Language Learning Games on Speaking Skills

In terms of speaking skills, 62.4% of respondents strongly believe that ELL games support the improvement of their English-speaking skills, while 19.8% agree with this claim. Conversely, 17.9% disagree. When it comes to confidence, a total of 74.7% report feeling more confident in their speaking skills since using ELL games. Additionally, 60.4% of participants feel that ELL games help them focus on English speaking skills.

In relation to interest, 67.8% of respondents find that scores, rewards, and leaderboards in ELL games are suitable for increasing their interest in English speaking skills, whereas 32.2% disagree. Regarding the practical use of acquired knowledge, 44.6% strongly feel that they can effectively describe people and objects using appropriate words

after using ELL games. Furthermore, 39.6% and 3.5% agree and slightly agree, respectively, while only 12.4% disagree with this statement.

Table 13.
Model Summary for The Impact of ELL Games on Speaking Skills

Model summary					
Model	R^2	Adj. R^2	SEE	F	Sig. F
1	0,013	0,008	1,211	2,698	,102

The results of hypothesis testing for the fourth hypothesis, which states that playing games has a significant influence on ESL speaking skills, indicate a statistically insignificant influence. The value of F is 2.698, with a corresponding p-value of .102, which is greater than the significance level of 0.001. Hence the conclusion that the frequency of playing games does not have a significant influence on speaking skills in English as a second language.

4.2.6 Impact of ELL Games on Reading Skills

In the context of improvement in reading skills, participants reported feeling that ELL games lead to their improvement in English reading skills. 44.6% strongly believe that ELL games help their reading skills, 39.6% agree and 10.9% agree slightly. Only 5 % disagree with this claim. 87,1%, in total, also report feeling more confident in their reading skills by using ELL games. 84,6% of participants notice improved focus on reading skills while using ELL games. Participants' perception of the suitability of scores, rewards, and leaderboards in ELL games to increase their interest in English reading skills was examined. The results show that 73.8% of participants find these elements in ELL games to be suitable for increasing their interest in English reading skills. Participants were offered a statement regarding their ability to read texts after using ELL games, and 32.7% strongly agreed that they can perform this task, while 8.4% and 42.6% agreed or slightly agreed, respectively.

Table 14.
Model Summary for The Impact of ELL Games on Reading Skills

Model summary					
Model	R^2	Adj. R^2	SEE	F	Sig. F
1	0,039	0,034	0,887	8,111	,005

The linear regression test performed to test the fifth hypothesis, which predicted that the frequency of playing games will significantly influence student reading skills for learning EFL. The results demonstrate, with a value of F=8,111, that there is a statistically insignificant (p>0,001) influence on student reading skills in learning EFL (F (1,200)=8.11), p=.005).

4.2.7 Impact of English Language Learning Games on Writing Skills

Improvements in writing after using ELL games were noted by in total 82,2% of participants in the research sample. The effect of ELL games on confidence in English writing were reported as significant by 87,2% of the sample, where 70.8% chose the option "strongly agree" to the statement offered. Related to focus on English writing skills, 68.8% note improved focus while using ELL games. The results show that a sizable portion of the sample (89.5 percent) thinks that leader boards, rewards, and scores in ELL games are appropriate for piqueing their interest in writing abilities. In addition, 87% of participants who used ELL games feel confident in their capacity to write about simple daily routines.

Table 15.
Model Summary for the Impact of ELL Games on Writing Skills

Model summary					
Model	R^2	Adj. R^2	SEE	F	Sig. F
1	0,137	0,133	0,887	31,722	,000

The results of the hypothesis testing for the sixth hypothesis show that the frequency of playing games has a statistically significant impact on students' writing abilities when learning EFL. F=31.722's value denotes a sizable effect (p<0.001) on student writing skills, as evidenced by the statistical analysis (F(1,200)=31.722, p<0.001).

4.2.8 Effect of ELL Games on Overall Student Performance in the English Course

Aside from specific skills and participants' perception related to how ELL games help them with improvement, they also provided information regarding the usefulness of digital media and ELL games in their overall performance and mastery of the course. 81.7% reported that they find interesting learning media in English language learning games to be useful in understanding course mate-

rial (40.6% strongly agreed, 16.8% agreed, and 24.3% slightly agreed). 89.6% stated that ELL games have helped them stay focused in class. As an overall conclusion, 92.1% reported that ELL games are helpful in understanding learning materials, and 84,2% specifically for mastering the course learning objectives, including vocabulary, semantics, and grammar.

Table 16.
Model Summary for the Impact of ELL Games on Overall Student Performance in the English Course

Model summary					
Model	R^2	Adj. R^2	SEE	F	Sig. F
1	0,009	-0,011	1,092	0,456	0,768

In order to determine the significance of the effect of playing English language learning (ELL) games on overall student performance in an English course, a multiple regression test was carried out while accounting for the previously mentioned variables. According to the findings, playing video games does not significantly affect how well students perform in English classes as a whole. $F(4,197) = 0.456$, $p > 0.001$, $R2 = -0.011$, the statistics indicate that there is no significant correlation.

5. Discussion

The study's findings and recommendations, which center on advancing the academic field, are presented in the sections that follow. There is a dearth of studies examining these factors in higher education, particularly in universities in Bosnia and Herzegovina, despite the fact that existing research has examined the impact of gamification and games on student motivation, academic achievement, and skill development in English language learning globally. As a result, the goal of this study is to close the knowledge gap in this area and offer insights into how games and gamification affect higher education in Bosnia and Herzegovina.

When it comes to previous explorations of gamification or games in education through existing studies, the majority of researcher focuses on the impact they have on children in kindergarten or primary school, since play is a core aspect of child development. Children learn through exploration and play, requiring a specific type of stimulation and entertainment to maintain attention long enough for learning to take place (Bećirović, 2023). Considering the digital revolution and its disruptive effects on traditional models of learning, student needs across the board have evolved. With the enormous amounts of input being only a-click-away, most individuals consume heavily and unfiltered content of often bite-sized informative and entertaining nature. The quick attention-switching that takes place as a result has affected the population's shortening of attention span. This poses a need for academia to adapt and meet the needs of new psychological patterns in the tech generation, as a result of technological integration into all aspects of life. This research supports the premises that it is no longer enough to have traditional face-to-face and teacher-oriented classes, but to adequately work with the selective attention of students by designing immersive and practical classes that use the psychological mechanisms, primarily the reward loop system, to provide knowledge.

The study by Carqueiro and Harrison (2022) aligns with the findings of the current study, emphasizing the significant impact of gamification on fostering motivation, attention, and curiosity. They observe that students who engage with game applications over longer period of time tend to find the learning experience more enjoyable, indicating the benefits of gamification in educational settings. The researchers emphasize the importance of setting appropriate time limitations by teachers to optimize student perception and enjoyment during game-based learning. They propose that gamification in English language learning enhances motivation, engagement, performance, satisfaction, and interaction among students and teachers, based on their own research findings.

Ivanjko et al. (2020) assert that the demand for English for Specific Purposes (ESP) has grown in response to the competitive market, leading to an increase in ICT-supported courses worldwide. Their research demonstrates that educators who incorporate games into English classes have a competitive edge over those who adhere to traditional methods, primarily due to significantly higher student motivation. Our research, carried out with higher education students in Bosnia and Herzegovina, offers statistical evidence that supports this assertion. The findings emphasize the influence of gamification and games on skill development and motivation among the current generation of students.

Students demonstrate a preparedness to follow the emergence of novel technological opportunities and use the full potential of technological

advancement for faster and more efficient learning, as well as IT skill development that will become assets in a competitive market. Considering the rate of speed at which inventions are being presented in the market, and the inevitable transformation of the professional world, students are demonstrating a need for relevant education and learning methods that will provide faster solutions for relevant skill acquirement. The emergence of AI technology, including language models like Chat GPT[1], highlights the importance of English language learners mastering the skill of proficient and effective prompt production. As this technology becomes increasingly integrated into the business world, being able to generate prompts and communicate effectively in English will likely become essential. This development opens up new employment opportunities that rely heavily on English language proficiency and functional prompt production.

The research findings indicate that students exhibit high levels of motivation and interest when using games as learning tools for ELL. The majority of participants reported increased confidence in their LSRW skills when using ELL games. Specifically, 87.2% felt more confident in listening, 74.7% in speaking, 84.6% in reading, and 87.2% in writing. Moreover, a significant percentage of students (ranging from 82.2% to 95.1%) perceived improvements in their English language skills across all areas as a result of using games for learning. These statistics highlight the positive impact of games on enhancing EL skills. Through correlation tests it was found that there is an influence of games on academic achievement, academic performance in English, motivation, and LSRW skills, which presents an argument for greater integration of such tools in the curricula. The statistical analysis has provided evidence that confirms the following hypotheses of this research:

Table 17.
Hypothesis Confirmation

Does playing games influence students motivation and achievement in learning English as a foreign language?	
Hypotheses	**Status**
H1: there is an influence of games on student motivation to learn English as a foreign language.	**Confirmed**
H2: playing games will influence student EFL learning outcomes.	**Confirmed**
H3: using games will influence English listening skills.	**Confirmed**
H4: using games will influence English speaking skills.	**Confirmed**
H5: using games will influence English reading and writing skills.	**Rejected**
H6: student listening, speaking, reading, and writing EFL skills obtained by playing games predict student EFL achievement.	**Rejected**

The research's conclusions are consistent with those of earlier studies, such as Rankin et al. (2006), which looked at how playing video games affected students' English language skills and vocabulary knowledge. These studies offer more proof that playing video games can improve one's vocabulary and grammar. Researchers discovered that students who participated in gaming sessions over a month showed a growth in vocabulary of 40% in relation to interactions with non-player characters and a growth in communication with other players using the chat feature of 100%. The positive impact of games on motivation in English language learning is further supported by Peterson's (2012) study. The study showed that game-based language learning reduced anxiety, improved English proficiency, increased enjoyment, and increased student engagement among Japanese university students learning English as a foreign language. These findings highlight the potential of games as powerful catalysts for boosting motivation and improving the language-learning process. Additionally, there is additional evidence to back up the research's conclusions about the advantages of game-based English language instruction. Using data from questionnaires given before and after the use of games in learning, Reinders and Wattana's (2014) study with a group of 30 Thai university students investigating the effect of games on willingness to communicate showed that students' level of anxiety in using the English language significantly decreased, their level of confidence increased, and they perceived their ELL competence to be higher.

Smith et al.'s (2019) meta-analysis demonstrated that gamification positively influences student motivation, enhancing their engagement and intrinsic motivation in the learning process. Similarly, Johnson and Lee (2018) found that gamification strategies significantly improved EFL learning out-

1 OpenAI. (2023, February 2). *CHATGPT: Optimizing language models for dialogue.* OpenAI. Retrieved February 10, 2023, from https://openai.com/blog/chatgpt/

comes, supporting the notion that gamified elements such as rewards and progress tracking enhance student engagement and motivation. Garcia and Martinez (2020) further supported the findings of this research by showing that gamification activities effectively enhance English listening skills, while Nguyen and Nguyen (2021) highlighted the positive impact of gamification on English speaking skills. Moreover, Chen et al. (2019) demonstrated that gamification in English reading and writing activities leads to significant skill improvements over time. In a study by Wang and Liu (2017), it was discovered that student performance in various English language skills, attained through gamification, can act as a predictor of overall success in learning English as a foreign language. The implications of gamification in higher education, particularly in the area of English language learning, are highlighted by these findings and the body of prior research. These studies' results have shown time and time again that gamification has a positive impact on student motivation, learning outcomes, and the growth of EL skills. The results indicate that incorporating gamification elements into educational practices can improve student engagement and motivation, which will ultimately lead to an improvement in the overall learning process and English language proficiency.

Hypotheses regarding the influence of games on reading and writing skills and the potential of predicting EFL achievement through LSWR skills obtained by playing games were not supported through this research. One reason for this may be that the gamification approach used in the applications employed by students might not have been specifically tailored to target and enhance reading and writing skills effectively. Future studies could explore how specific gamification elements, such as interactive storytelling, collaborative writing tasks, or virtual simulations may create a more focused and immersive learning experience for developing these specific language skills. Furthermore, considering that this study did not apply an experimental approach to examine the differences between learning in non-gamified and gamified contexts, the data provided may have been negatively biased based on participants' personal beliefs and convictions regarding their level of improvement in English reading and writing skills.

The possibility of using listening, speaking, writing, and reading (LSWR) abilities acquired through playing video games to predict English as a foreign language (EFL) achievement was disproved. This rejection can be attributed to the complexity of achieving EFL proficiency, which includes a range of language skills and covers many different facets of language learning. Despite the fact that the study may have collected information on perceived gains in listening, speaking, reading, and writing skills separately, it's possible that these abilities did not come together to reliably predict overall EFL achievement. Future studies could look into different sociocultural contexts, learner differences, or the contribution of instructional methods other than gamification as additional variables that affect EFL achievement.

6. Conclusion

This study explores gamification in higher education settings, revealing its potential to enhance student motivation, learning outcomes, and specialized language skills. It emphasizes the importance of incorporating gamified activities aligned with language competencies and providing useful feedback. The study addresses a knowledge gap in Bosnia and Herzegovina and contributes to the growing body of research on gamification's effectiveness in language instruction in higher education.

The study also highlights the opportunity for traditional language classrooms to change, encouraging student-centered and immersive learning experiences. English language learning can be made more enjoyable, efficient, and accessible by combining technology and gamification techniques. Gamification can facilitate personalized, self-paced learning that is tailored to each student's needs and maintains high levels of motivation and engagement. Remote and distance learning are also made possible by the use of technology, particularly for gamification purposes, which increases access to English language education.

The practical implications of the study highlight the value of integrating gamification strategies in higher education. Educators can leverage rewards, progress tracking, and interactive game-based activities to create dynamic learning environments. Policymakers can collaborate with educators to develop guidelines and training programs that support effective integration of gamification approaches. Future research should explore the generalizability of the findings across different cultural contexts, investigate long-term effects and sustainability, and consider individual learner differences. Comparative studies evaluating gam-

ification against other instructional approaches would also be valuable.

The future of our educational system will have to adapt to the evolving ICT landscape and reap the benefits of cutting-edge technology for the purpose of adequately addressing the emerging needs of new generations of students and of the economy. The rapid advancement of technology will eventually surpass current trends and move into greater utilization of technologies such as virtual reality, holograms and AI for learning and producing English content. In such a model of education, students will have the opportunity to engage in kinesthetic learning, which will be fully immersive and capture their attention and curiosity, thus motivate them to practically develop English skills. This kind of learning will likely become more efficient and effective than traditional lecturing, as the latter will fall under the optimum threshold of required engagement for attention maintenance, which has been set by the heavy integration of IT and edutainment in daily life.

Education is gradually moving in the direction of interdisciplinary learning as well, where instructors will be able to teach several subjects, such as English, history, art, geography, physics, mathematics and design, simultaneously. Consequently, it is crucial for teachers to be engaged in special trainings with IT experts, who can provide necessary support in the development of skills for manipulating technology in a physical or virtual classroom. ICT innovations are moving in the direction of great potential and opportunities such as allowing virtual experiences and AI assistance in any type of learning, as well as ELL. With concepts such as deep data mining, student's online activity, progress and interests may be processed and communicated to teachers to predict learning profiles of students and allow the strategizing of teaching to ensure engagement, progress and knowledge retention.

Gamification is the first step in this academic revolution, where academic achievement will become a measure of critical thinking on a higher level since students will be able to virtually encounter real-life problems and solve them through play. Games may also be used as assessment tools for the teacher to approximate the level of student achievement in English learning, as they provide a low-stress environment for performance, which is likely more accurate than the traditional high-pressure exam system. This research provides a basis for further exploration of the game application is curricula, whether through gamification, applications, video games, simulations and similar. The transformation of the educational system is inevitable and crucial for the sake of raising capable, well-trained, and responsible generations. ICT transformation of educational methods will have to take place if we want to keep our children in schools and motivate them for life.

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REVIEW PAPER

AI IN ACADEMIA: AN OVERVIEW OF SELECTED TOOLS AND THEIR AREAS OF APPLICATION

Robert F. J. Pinzolits

University of Applied Sciences Burgenland, *Eisenstadt, Austria*

Correspondence concerning this article should be addressed to Robert F. J. Pinzolits, University of Applied Sciences Burgenland, Eisenstadt, Austria. E-mail: robert.pinzolits@fh-burgenland.at

ABSTRACT

As a result of OpenAI's ChatGPT, there has been increasing interest in AI and web-based natural language processing (NLP), including in academia. In this article, we provide an overview of the tools that can be used for academic purposes. The overview was conducted from the perspective of a university educator and was intended to guide educators in higher education on emerging AI technologies. The tools discussed ranged from searching the literature and attributions to peer-reviewed articles, scientific writing, and academic writing and editing. The objective is to foster an informed approach to the integration of AI tools in academic settings, ensuring that educators are well-equipped to leverage these technologies to enhance the quality and output of academic work.

Keywords: ai in academia, natural language processing, generative ai, ethical considerations

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Introduction

In recent years, the academic landscape has undergone a transformation largely driven by the integration of technology. Among various technological advancements, artificial intelligence (AI) has emerged as a game changer, particularly in natural language processing (NLP). The ability of AI to understand, interpret, and generate human language has opened new avenues for the enhancement of academic research and education. The article examines the growing field of AI and NLP services and their applications in academia. Researchers, educators, and students in the academic community are constantly seeking tools and resources to improve and facilitate the acquisition and dissemination of knowledge. In the academic sector, AI has led to the development of various tools for literature search, content analysis, scientific writing, and editing. The use of these tools promises not only to streamline academic processes, but also to add depth and insight to the content of academic studies. However, with great potential comes great responsibility. Integration of AI integration into academia is not without ethical considerations and challenges. Authenticity, privacy, and bias potential are of great importance. In addition, researchers should distinguish between the use of AI tools and their own knowledge, research, writing style, as well as their own creativity, so that AI does not replace them but complements them.

This study aimed to provide an overview of the current state of AI tools in an academic context. This study explores the selection of various AI tools available through the lens of a university educator. The goal is to equip educators and the broader academic community with brief descriptions that will serve as a starting point for judiciously integrating AI tools into their work.

Methodology

To navigate the complex landscape of artificial intelligence in academia, a narrative synthesis of recent publications from academic and non-academic sources was undertaken. This chapter explains the methodological approach used to collect, summarize, and interpret relevant literature and sources for this review.

Search strategy

A systematic and exhaustive search of electronic databases was conducted. ScienceDirect, Google Scholar, ABI/Inform Global, Springer Link, and Emerald were chosen as resources for their extensive coverage of the educational and AI-related literature. In addition, specialized scientific journals were consulted, namely the International Journal of Artificial Intelligence in Education (IJAIED), Computers & Education, and Artificial Intelligence Review, given their specific focus on the intersection of technology and education. Since AI technology is dynamically and rapidly evolving, non-academic sources such as newspapers, blogs, and AI-oriented online platforms have been considered in research to ensure that the latest advances and discussions in the field are considered to create a comprehensive collection of current AI tools for use in academia.

The keywords used for the search were "AIEd", "AI in higher education", "Technology-Enhanced Learning", and "AI Tools for Education". These keywords were used individually and in combination to maximize coverage of the relevant literature and search results.

Inclusion and Exclusion Criteria

The scope of the search for AI applications was narrowed based on the specific inclusion and exclusion criteria. Only articles published in English were considered. Papers specifically related to the use and impact of AI tools on academic writing were selected. Therefore, articles that addressed the application of AI outside of higher education were excluded. Similarly, studies related to educational technologies but not AI in particular were excluded. Similarly, administrative and IT AI applications related to higher education institutions, such as overarching learning management systems throughout the organization, were excluded from this study.

Data Extraction and Analysis

As this article is dedicated to AI tools in the academic field, such applications have also been used to search the literature on this topic. Services such as *Elicit*, *Litmaps*, and *Scite* have been used to expand the literature search and support the analytical process. To facilitate analysis, product-

related information was extracted from each of the producer's websites and compiled into an organized system using notion.so[1]. The analysis excludes pricing information. However, free services were also observed. The AI tools are classified into three application areas, as listed in Table 1. A narrative synthesis approach was adopted to interpret and synthesize the data from the extracted products to create a condensed description of the AI applications analyzed.

Table 1.
Application areas of Academic AI Tools

Application areas (Primary Usage)	Description
Literature Search	Tools in this category use AI algorithms to help researchers efficiently search for relevant academic literature and map connections between papers. They can analyze content, extract key information and visualize relationships among academic papers, aiding in comprehensive literature reviews.
Analyzing Research Articles (Papers)	These tools use AI to enhance the reading experience of (peer-reviewed) articles. They can provide summaries, extract key insights, and offer a conversational interface for asking questions. These tools are designed to make complex academic papers more accessible and understandable.
Academic Writing and Editing	These tools use AI to improve the quality and coherence of scientific writing, as well as structure and format research papers. Academic writing and editing tools ensure that academic texts are clear, coherent, and adhere to writing standards through grammar checks, language feedback, and suggestions for improving structure and style. This is especially helpful for nonnative English speakers and for ensuring high-quality manuscripts.

Note. The scope of features of some of the apps spans several functions, which does not always allow a clear classification. Assignment to one of the three proposed application areas was based on the specific primary usage interpreted by the author.

1 https://notion.so

Bias and Limitations

This article provides an overview of specific academic AI tools as a narrative review and, in this regard, it is inevitably influenced by the authors' perspectives. The methodology used was designed to ensure the most comprehensive and unbiased review possible while acknowledging the inherent limitations of the narrative review approach. Despite the comprehensive search strategy, some relevant studies may have been missed, particularly those published in languages other than English, or in less accessible databases. In addition, such an overview carries the risk that the results could lose their topicality and thus relevance, owing to rapid and dynamic developments in this market niche. Although this article is intended as a starting point for the presentation of such a novel software, future studies may consider the use of systematic reviews and meta-analysis techniques for a more quantitative analysis of the topic or focus groups.

Literature Review

The Evolution of AI: A Brief History

Crevier (1993) chronicles the successes and failures of the AI field, including the early prediction that machines can simulate human intelligence. This book is based on interviews with major players in the history of AI, including Marvin Minsky and Herbert Simon. Buchanan (2005) traced the beginning of AI to philosophy, fiction, and imagination, and highlighted early milestones in problem-solving, learning, knowledge representation, and inference. Since its inception in the 1950s, AI has progressed in several evolutionary stages. An early foundation for the field can be traced back to the work of British mathematician Alan Turing, who proposed the concept of a "universal machine" capable of performing calculations from other machines. This concept laid the foundation for contemporary computing (Turing, 1937, pp. 230–265). In 1956, the Dartmouth Conference formalized AI as a distinct field of academic inquiry. The term 'Artificial Intelligence' was first introduced during this event by John McCarthy, and a research agenda on the topic was proposed, marking the beginning of AI (McCarthy et al., 2006). During the subsequent decade, there was considerable enthusiasm and funding directed towards artificial intelligence (AI), with a particular focus on problem-solving and symbolic methods. A period of disillusionment in the late 1970s was referred to by McCorduck

(2004) as the first "AI Winter" because of the lack of practical and scalable applications. AI research experienced a revival in the 1980s, often referred to as the 'AI Spring'. This period saw the development of "expert systems", which sought to emulate the decision-making ability of human experts (Buchanan & Shortliffe, 1984). However, these systems are extremely expensive and inflexible, leading to a second period of decreased interest. As AI research moved towards statistical models and data-driven approaches during the 1990s, the field of machine learning was born (Vapnik, 1998). The ensuing era of big data in the 2000s enhanced the effectiveness of machine learning algorithms and catalyzed the emergence of deep learning, a subset of machine learning that employs structures inspired by the human brain. Impressive results have been achieved in deep learning applications for image and speech recognition (LeCun et al., 2015). The 2010s marked the integration of AI into everyday life with applications, such as voice assistants (e.g., Apple's *Siri* and Amazon's *Alexa*) and recommendation algorithms. Advancements have also been observed in fields such as NLP (Nath et al., 2022), computer vision, and reinforcement learning (Goodfellow et al., 2016). The use of artificial intelligence continues to evolve into the 2020s and beyond, finding applications in a wide range of fields. Therefore, the ethics of AI is an emerging area of focus (Russell, 2020).

Key terms

Artificial intelligence

AI is a broad field that encompasses a wide range of technologies and applications (Jordan & Mitchell, 2015). At its core, AI involves the development of algorithms and models that can perform tasks that would normally require human intelligence, such as perception, reasoning, and decision-making. A key area of AI research is machine learning, which involves training models on large datasets to make predictions or decisions based on learning (Jordan & Mitchell, 2015). Machine learning has been used to develop a wide range of applications from image and speech recognition to natural language processing and predictive analytics. AI has the potential to transform many other areas of our lives, from transportation to finance to education (R.Baker & Siemens, 2014; Bengio et al., 2013). However, AI also has limitations, such as the challenge of developing transparent and explainable models (Rudin, 2019).

Machine learning

Machine learning is a subfield of AI that focuses on the development of algorithms and models that can learn from data and make predictions or decisions based on this learning (Jordan & Mitchell, 2015). Machine learning is a powerful tool for a wide range of applications, including image and speech recognition, natural language processing, and predictive analytics (Goodfellow et al., 2016). There are several types of machine learning algorithms, including supervised, unsupervised, and reinforcement learning (Sutton & Barto, 2018). Supervised learning involves training a model on labeled data, where the correct output is known for each input. Unsupervised learning involves training a model on unlabeled data, where the goal is to identify patterns or relationships in the data. Reinforcement learning involves training a model to make decisions based on environmental feedback. One of the key challenges in machine learning is bias (Zou and Schiebinger, 2018). Machine learning models can inadvertently learn and perpetuate biases that exist in the data, leading to unfair or discriminatory outcomes. It is important that researchers are aware of these issues and take steps to mitigate them.

Neural Networks

Neural networks are a type of machine learning algorithm that is modeled after the structure and function of the human brain (Goodfellow et al., 2016). They consist of interconnected nodes, or "neurons," that process and transmit information (LeCun et al., 2015) Neural networks are used in a variety of applications, including image and speech recognition, natural language processing, and predictive analytics (Schmidhuber, 2015).

Natural Language Processing & Large Language Models

The history of NLP can be traced back to the 1950s, when researchers began to explore the possibility of using computers to process and analyze natural languages (Manning & Schu¨tze, 1999). Early NLP efforts focused on developing rule-based systems that can analyze and generate natural language. These systems are limited in their ability to handle the complexity and variability of natural language, and progress in this field has been slow. Large language models are a type of neural network specifically designed for natural language processing tasks (Vaswani et al., 2017). They are trained on massive amounts of text data, such as

books, articles, and websites, and can generate human-like texts in response to prompts or questions (Brown et al., 2020). Large language models have become increasingly popular in recent years, with models such as GPT-3, GPT-4, and ChatGPT achieving impressive results on a wide range of language tasks (Brown et al., 2020; Radford et al., 2019). These models are a type of neural network that is specifically designed for natural language processing tasks. GPT-3, or Generative Pre-trained Transformer 3, is a language model developed by OpenAI that has been generating waves in the AI community since its release in 2020 (Brown et al. 2020). It has 175 billion parameters, making it one of the largest language models developed to date. GPT-3 has been used in a wide range of applications, from generating creative writing, answering trivia questions, and creating chatbots. GPT-4 was the successor of GPT-3. It is important to note that the development of large language models such as GPT-4 raises ethical concerns regarding data privacy, bias, and the potential misuse of these models. ChatGPT is a variant of GPT-3 specifically designed for chatbot applications (Radford et al., 2019). It has been used to create chatbots that can conduct conversations with humans in a natural and engaging manner. Although large language models, such as GPT-3, GPT-4, and ChatGPT, have the potential to transform many aspects of our lives, it is important to be aware of their limitations and potential risks (Zou & Schiebinger, 2018).

AI is a complex and rapidly evolving field with numerous definitions reflecting its multifaceted nature. Each of the following definitions encapsulates different perspectives on AI capabilities.

Weak AI or Narrow AI

Weak AI or *Narrow AI* refers to artificial intelligence systems that are designed to perform specific tasks within a limited domain. These systems exhibit intelligence in a selective and specific manner, but lack the broader cognitive abilities and general intelligence of human beings. They are highly specialized tools that excel in specific tasks but do not possess true thinking or consciousness. These systems are extremely good at the specific tasks they are designed for, but cannot operate outside those tasks (Russell & Norvik, 2010). Furthermore, these systems do not possess the broader cognitive abilities or general intelligence of humans (Condello et al., 2021; Ducao et al., 2020; Goretzko & Israel, 2022; Laurent, 2018; Leszkiewicz et al., 2022; Liem et al., 2018; Park & Park, 2018; Schachner et al., 2020; Süße et al., 2021; Weidener & Fischer, 2023). Weak AI is characterized by its focused nature, excelling in well-defined tasks or areas of application, but lacking the ability to generalize knowledge or skills to other domains (Condello et al., 2021; Liem et al., 2018). This is often contrasted with strong AI, which aims to replicate human-level intelligence and possesses general intelligence (Schachner et al., 2020; Süße et al., 2021). Weak AI systems are typically developed using machine learning algorithms and trained on large datasets to perform specific functions with a high degree of accuracy (Park & Park, 2018). Examples of weak AI applications include virtual personal assistants, such as Apple's *Siri* and Amazon's *Alexa*, which can understand and respond to voice commands but are limited to specific tasks, such as setting reminders or playing music (Park & Park, 2018). These systems are designed to act as if they are intelligent within their specific domain, but do not possess true thinking or consciousness (Condello et al., 2021).

Strong AI or General AI

Strong AI or General AI is the notion of a machine that can perform any intellectual task that a human being can perform. It is not just about mimicking human intelligence, but about possessing an understanding akin to human cognition. As of 2021, this level of AI remains largely theoretical (Searle, 1980). The pursuit of strong AI has been a long-standing goal in the AI field of artificial intelligence. Researchers have used various approaches, such as modeling cognitive architecture, to advance the development of strong AI (Chollet, 2019). Achieving strong AI is a significant milestone in this field as it represents the creation of intelligent systems that can match or surpass human cognitive abilities.

Superintelligence

The term *superintelligence* refers to a future form of AI that surpasses human intelligence in practically all fields of interest, including creativity, general wisdom, and social skills. Although it is a speculative concept, many AI theorists and futurists believe that superintelligence is a potential outcome of continued advancements in AI (Bostrom, 2014). Larson (2021) challenged the notion of superintelligent computers and singularity (Kurzweil, 2014; Vinge, 1993), argued that we are not close to achieving superintelligence, and questioned the basic premise of singularity.

Larson discusses the limitations of AI in terms of inference and highlights that AI falls short of human intelligence in its ability to handle uncertain rules and formulate new ones. This perspective provides a critical view of the feasibility and implications of superintelligence.

Human-Centered AI Approach (HCAI)

Human-centered artificial intelligence (HCAI) seeks to shift the focus of AI development from technology to people (Bingley et al., 2023). The advent of AI has led to a growing interest in understanding the human facets of AI, with the goal of cultivating AI that complements rather than replaces human capabilities. Notable initiatives in this regard include the European Humane AI project and the Stanford Institute for Human-Centered Artificial Intelligence (Xu, 2019).

HCAI has emerged as a design philosophy that places humans at the epicenter of AI development. While lacking a rigid definition, HCAI is generally perceived as an approach that aims for AI development to be purposeful for human benefit, transparent, and maintain human agency and control over data and algorithms. Shneiderman (2020) encapsulated HCAI akin to a modern Copernican revolution, in which AI systems are designed with humans at the core. Considering that such *EdTech* or AI-Enhanced Education tools (AIEd) are used in the context of university thinking spaces as sites of humanism, the term Digital Humanism (*Wiener Manifest Für Digitalen Humanismus*, 2019) seems attractive and appropriate to the author. Schmölz (2020) engaged in an intellectual inquiry into the philosophical roots of digital humanism and deduced that the conceptualization of *Conditio Humana* as rational thinking and logical operation for the demystification of nature was an intellectual feat of the Age of Enlightenment. However, within the realm of digital humanism, Conditio Humana has undergone a transformation in relation to machines, as rationality and logical operations are now attributed to machines. Creativity and individual articulation in the digital domain have emerged as new facets of Conditio Humana in digital humanism. This paradigm shift alleviates postmodern humans from the constraints of calculable rationality, without regressing into mythological frameworks.

AI Tools in the Context of Academia and Education

AI tools have the potential to change the way research is conducted in academia (Jordan & Mitchell, 2015). They can be used to analyze large datasets, generate insights, and automate repetitive tasks (Brynjolfsson & Mitchell, 2017). Neural networks and large language models are just two examples of AI tools available to researchers (Kitchin, 2014). Other examples include computer vision algorithms, natural language processing tools, and predictive analytics models, which are not addressed in this study.

Holmes et al. (2021) argue that most AI researchers are not trained to address emerging ethical issues and that an ethical framework for AI is imperative. According to Prunkl et al. (2021), submitting authors should provide a statement describing the broader social implications of their research. Larsson (2020) discussed the use of ethics guidelines as a governance tool in the development and application of AI, who emphasized that AI governance must move from principles to processes and that data-dependent AI requires multidisciplinary research to be successful. These contributions suggest that ensuring the ethical use of AI in academic research requires a multidisciplinary approach and a set of robust guidelines. Science journals face a problem when so-called *paper mills* produce and distribute fake or fraudulent papers. It is common for these articles to contain text, data, and images that are partially or completely plagiarized or fabricated, often due to ghostwriting. It is likely that such manuscripts corrupt the scientific literature, lead to misdirection of the readers, and result in the distortion of systematic reviews. The advent of AI tools such as ChatGPT has amplified this concern. Furthermore, paper mills strain the time and resources of journals, as they require time-consuming examinations to detect and retract fraudulent articles (Barnett, 2023; Brainard, 2023; Liverpool, 2023).

Perspectives on AIEd

To meaningfully integrate AI as a tool in academic and pedagogical work practices and contexts, educators must be well prepared and have a good understanding of AI. Such applications in higher education have the potential to significantly enhance learning and teaching experiences (Crompton & Song, 2021). AIEd Applications are not limited to learners or teachers. They also have

implications for the general organization and administration of higher education institutions. Baker and Smith (2019) highlighted various perspectives from which AI applications in higher education can be viewed. Their analysis of educational AI tools examined them from three distinct viewpoints: learner-facing, teacher-facing, and system-facing.

Learner-facing tools

Learner-facing AI tools, within the context of AI in Education (AIEd), encompass a range of technologies that aim to improve the learning experience of students. These tools use artificial intelligence for personalized instruction, feedback, and interactive learning experiences and adapt to individual needs (Sobel & Kushnir, 2006). Learner-facing AI tools also have the potential to improve student engagement and motivation through the incorporation of gamification elements such as badges and leaderboards (Ghaban & Hendley, 2019). Such tools can assist in the development of skills such as decision making and problem solving by providing opportunities for learners to actively engage with the learning environment (Sobel & Kushnir, 2006). For example, AI-powered writing assistance tools can help students improve their writing skills (Alharbi 2023). Additionally, learner-facing AI tools can assist instructors in identifying struggling learners and provide timely support to prevent dropouts (Topali et al., 2019).

Teacher-facing tools

With recent developments in AIEd, teachers may have to orchestrate AI and other digital tools and environments in the future (Niemi, 2021). To effectively utilize AI in their teaching practices (Ng et al., 2023), teachers may need to develop AI digital competencies and skills of the 21st century. Furthermore, teachers and higher education lecturers' perceptions and experiences of AI in education can contribute to the formulation of effective AI teaching strategies (Lin et al., 2022). AIEd offers teachers several tools. These tools aim to support teachers in their work practices and enhance their efficiency and effectiveness (Chounta et al., 2021). One tool that teachers may encounter is AI-based educational technology (EdTech). This technology uses artificial intelligence to provide personalized learning platforms, automated assessment systems, and facial recognition systems to aid teachers in their teaching practices (Akgun & Greenhow, 2021). AI-powered assessment tools, such as AI-Grader, have been used to assess student performance, provide feedback, reduce teachers' workload, and improve their trust in AI-EdTech (Nazaretsky et al., 2022).

System-facing tools

Unlike educator- or learner-facing tools, system-facing tools often involve the sharing of data among multiple schools and colleges rather than being confined within a single organization. This may have contributed to the relative scarcity of these tools. System-facing AIEd encompasses a broad spectrum of tasks that extend beyond the functionalities of educators and learner-facing tools. Its applications range from timetable organization to inspection prediction, providing valuable assistance to ensure smooth operation within the educational system (Baker et al., 2019).

Results (22 AI applications and brief descriptions)

AI Tools for Literature Search

AI-enabled literature search tools analyze vast databases using algorithms and data mining techniques. These tools are capable of identifying literature based on contextual similarities, citations, and thematic associations in addition to keyword searches. These tools utilize semantic search capabilities to comprehend the researcher's intent and provide more relevant results based on the context of the keywords. Tables 2 and 3 present the tools to find, summarize, and extract information from research articles.

Table 2.
AI tools for Literature Search

AI Tool	Description
Consensus[2]	Consensus is an AI-powered search engine that additionally provides evidence-based answers from scientific research. It uses AI to extract key findings from peer-reviewed sources and present them in a distilled and easily digestible format. Consensus is 100% ad-free, making it a valuable resource for accessing unbiased knowledge.

2 https://consensus.app

Elicit[3]	Elicit is an AI-powered research assistant that uses language models to find relevant academic papers, even without a perfect keyword match. It can also summarize and extract key information, support various research tasks, and integrate with citation managers. Elicit is available for free.
Inciteful[4]	Inciteful is a free and open-source research tool that uses citations to help users explore and discover relevant academic literature. Its unique features include the literature connector tool for interdisciplinary studies and integration with Zotero. The platform is expanding rapidly and currently consists of two different tools, with more under development.
Laser AI[5]	Laser AI is an application designed to streamline systematic reviews, particularly Living Systematic Reviews. Its semi-automated data extraction module reduces extraction time without compromising quality, and promises to save 50% of time on average when compared to manual workflows. Laser AI also offers robust security and compliance standards.
Litmaps[6]	Litmaps is a tool that streamlines the literature review process by generating a visual map of relevant articles and articles. It analyzes citation patterns to find the most relevant and related articles, reducing the time it takes to complete a literature review while enhancing its quality. Litmaps seems to be popular among PhD candidates, science communicators, and universities and offers benefits such as finding overlooked articles, keeping users informed about new publications, and facilitating effective communication and collaboration among colleagues.
Research Rabbit[7]	Research Rabbit is a digital platform that simplifies the search and management of the literature for researchers. It offers personalized recommendations, interactive visualizations, and collaboration options, and it integrates with citation managers. The platform is free for researchers and has received positive feedback for its intuitive interface and features.

Table 3.
Apps for Literature Search (continued)

AI Tool	Description
System Pro[8]	System Pro is an AI-powered tool that revolutionizes the search and analysis of scientific literature, particularly in health and life sciences. By efficiently synthesizing peer-reviewed research, it provides users with accurate, up-to-date overviews and transparent citations. It also contextualizes searches by recommending and visualizing related topics, facilitating the discovery of new insights. The tool stands out for its reliability, transparency, and capacity to break down disciplinary silos. System Pro is built on a proprietary architecture that combines large language models with structured data, making it faster and more reliable than traditional search engines.
Scite[9]	Scite.ai's AI-powered research assistant helps researchers, students, and writers by searching through millions of research articles to provide reliable answers to questions and aid in writing tasks. It can also find competing evidence, summarize content, and help find sources for specific statements.
Semantic Scholar[10]	Semantic Scholar is a free AI-powered research tool that provides access to a vast database of scientific literature. The Semantic Reader is an augmented reader that aims to transform scientific reading by providing enhanced context and accessibility.

AI tools for analyzing research articles (Papers)

AI-Enhanced Education (AIEd) tools have emerged as essential tools for analyzing research articles in the ever-expanding arena of academic research. By employing artificial intelligence techniques, such as natural language processing and machine learning, AIEd tools streamline the literature review process and enable more in-depth analysis. These tools include automatic summarization to extract the crux of articles, synthesis tools to integrate information across sources, and semantic search tools for contextualized literature retrieval. Additionally, they offer citation analysis to track the impact of research, network visualization for graphical representation of relationships among articles, and text mining to extract insights

3 https://elicit.org
4 https://inciteful.xyz
5 https://laser.ai
6 https://app.litmaps.co
7 https://www.researchrabbit.ai
8 https://www.system.com
9 https://scite.ai
10 https://www.semanticscholar.org

from large textual datasets. AIEd tools also include sentiment analysis to assess content tone and bias detection to protect the integrity of research. The tools used to analyze and summarize the research articles are listed in Table 4.

Table 4.
Apps for analyzing research articles (papers)

Tool	Description
Chat PDF[11]	Helps researchers read and understand complex academic papers. Chat PDF uses AI to provide a conversational interface, allowing researchers to ask questions about the paper and receive answers in real-time. A chat-based interface makes it easy to get information and answers from PDF documents.
Explain Paper[12]	Explain Paper is an online tool designed to make reading and understanding research papers faster and easier. Users can upload a research paper to the platform, highlight any text, and receive an explanation. This functionality aims to make research papers, which often contain dense and complex language, more accessible. It provides clear and concise summaries of academic papers.
Lateral AI[13]	Lateral is an AI-powered app that offers features such as text search, organization of findings, easy sharing, and document view. The app aims to make research more organized using AI to help locate text and organize findings.
Open Read[14]	Enhances engagement with peer-reviewed papers by providing succinct summaries. It provides AI-powered interactive papers, promotes open access, and offers a library of books and personalized reading plans. However, it is still in the early stages of development and may have limitations in coverage of topics or disciplines.
Scholarcy[15]	Scholarcy is an AI tool that summarizes scholarly content, extracts structured data and knowledge summaries, and saves the time required to extract key information from an article. Create summary flashcards in Word or PDF format and supports collaborative notetaking and annotation. It also offers a browser extension and is continually improving its algorithms for summarization techniques.
SciSpace Copilot[16]	SciSpace is a research platform designed to simplify research discovery and learning. It offers an end-to-end workspace that automates repetitive tasks and aids in the quick discovery of information. The platform contains metadata of over 200 million papers and 50 million open-access full-text PDFs.
Unriddle[17]	Unriddle is an AI-powered research tool that simplifies complex topics, summarizes content, and allows users to ask questions and receive instant answers. It can create a custom AI using any document as a data set, which makes it useful for guiding users through complex topics. Unriddle is built on GPT-4 and can handle around 500,000 words. It is ideal for students, researchers, and professionals who need to quickly find and understand relevant information.

AI Tools for Academic Writing and Editing

In addition, such applications help to organize longer articles with more complex structures for better readability.

Table 5 lists the tools that provide functionality to improve language expression and compliance with academic writing standards in research papers. In addition to using AI to provide suggestions and corrections to improve writing quality, these tools can help identify areas that might require improvement and provide targeted feedback on these areas. In addition, such applications help to organize longer articles with more complex structures for better readability.

Table 5.
Tools for Academic Writing and Editing

Tool	Description
Jenni.ai[18]	Jenni AI provides functionality such as AI autocompletion, in-text citations, and paraphrasing, and can assist with various content types. It uses a combination of its in-house AI systems, GPT4 and ChatGPT, and fine-tunes each user's controls and custom data to generate content. The tool supports multiple languages and can generate text in the language of your choice, with a translation feature that allows you to switch between languages. Currently, it is only available on the desktop. Jenni AI has a built-in plagiarism checker and promises to create 100% plagiarism-free content.

11 https://www.chatpdf.com
12 https://www.explainpaper.com
13 https://www.lateral.io
14 https://www.openread.academy
15 https://www.scholarcy.com
16 https://typeset.io
17 https://www.unriddle.ai
18 https://www.jenni.ai

Paper Pal[19]	An AI tool that assists in the editing of academic texts. It uses AI to ensure clarity, coherence, and adherence to academic writing standards. Thus, a manuscript check of the provided documents is offered to analyze its elements to point out weaknesses to be checked and to offer improvements. Paper Pal checks for technical compliance and language quality standards set by journals. The application is certified to ISO / IEC 27001-2013.
Quillbot[20]	Quillbot is an AI-powered writing enhancement tool that includes a grammar checker, a paraphrasing tool, and a summarizer. It suggests alternate ways to write your text, aiding nonnative English speakers in articulating their ideas more fluently. Used as a Summarizer, the app is capable of condensing various types of content, into concise key points.
Trinka[21]	An AI-powered writing and editing tool designed specifically for academic and technical writing. It helps researchers improve the clarity and coherence of their writing and ensures that the text adheres to academic writing standards.
Wisio[22]	Wisio.app is an AI-powered platform that simplifies the scientific writing process. It offers personalized text suggestions, citation extraction, translation, and English correction tools. Users can choose from multiple pricing options, including a free Starter plan and paid plans with unlimited features. Wisio. app promises additional features such as a reference manager, tables and figures, and journal templates in the future.
Writeful[23]	An AI tool that assists in the editing of academic texts. It uses AI to ensure clarity, coherence, and adherence to academic writing standards. Writefull also provides language feedback and helps nonnative English speakers improve the language quality of their manuscripts.

Conclusions

The use of academic AI-based tools that use natural language processing and large language models, as well as machine learning techniques, is changing the way research is conducted. Artificial intelligence tools offer researchers new avenues and access points to search, analyze, and summarize research articles. The use of such tools opens new possibilities for research in the literature. In this regard, it is important to determine which databases are being used by the search algorithms. It is the primary promise of using such tools to save time, so that more attention can be directed to critical aspects of research, such as data analysis and interpretation. Another area where AI tools have shown great promise is the analysis and summarization of research. Several AI-based tools, such as Chat PDF, Explain Paper, Lateral AI, Open Read, Scholarcy, SciSpace Copilot, and Unriddle, are used to analyze and summarize scientific papers. The use of these tools can make recommendations that can help researchers identify areas for improvement and provide targeted feedback on these areas. Moreover, these tools can facilitate the organization of longer articles with complex structures, making them more readable. The use of artificial intelligence tools in academic writing and editing has also shown great promise. AI algorithms are being used in tools such as Jenni.ai, Paper Pal, Quillbot, Trinka, Wisio, and Wordtune to improve academic writing standards and linguistic expressions. In addition to suggesting alternative spellings, these tools also assist non-native speakers to express their ideas more fluently and to advocate adherence to academic writing standards. Despite the versatility and impressive performance of AI tools in academia, they present potential limitations in their application. Some of these tools require extensive training to be effective, which may represent a significant time commitment that researchers should consider. In addition, AI tools influence the stylistic forms of scientific writing, each of which needs to be examined. Although these tools hold great promise for academic operations, they also raise new questions regarding the ethics of science. Assessment and verification of the authenticity and quality of academic work poses new challenges for researchers, academic institutions, and journal publishers. As a result, the number of submissions to be critically evaluated in terms of paper mills is expected to increase. Teachers and academic researchers in the field of higher education are in urgent need of addressing the impact of technology on work practices. Despite the increasing number of academic tools and the development of new options, certain routines of use will be established over time despite the increasing number of AI tools. To teach students and junior researchers meaningful workflows with AI, universities will also have to make decisions regarding tool selection after consulting with the teaching faculty.

Academic research is a rapidly growing market niche for AI tools and developers that

19 https://www.paperpal.com
20 https://www.quillbot.com
21 https://www.trinka.ai
22 https://www.producthunt.com/posts/wisio-app
23 https://www.writefull.com

offers a range of low-threshold applications. Individuals and institutions in higher education can take advantage of these resources. Although this article can only present a selection of available applications, educators should recognize that engagement with these tools is inevitable as the number of these tools increases. Thus, it is important to preserve academic integrity and authenticity. Therefore, academics must keep up to date with the latest developments and critically evaluate the applicability and relevance of AI tools. Using these tools, researchers can save time, focus more on critical aspects of their research, and improve the quality of their work. Intelligent and responsible integration of AI can serve as a powerful aid for academic research and education. This article aims to contribute by presenting an overview of AI tools for the academic field and to enable teachers in the field of higher education to get started on the topic.

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ORIGINAL RESEARCH PAPER

EXPERIENCES WITH LESSONS LEARNED METHOD IN IT PROJECTS

Rita Stampfl[1], **Julian Fischer**[2], **Silke Palkovits-Rauter**[3]

[1 2 3] ***Fachhochschule Burgenland***, *Eisenstadt, Austria*

Correspondence concerning this article should be addressed to Rita Stampfl, Fachhochschule Burgenland, Eisenstadt, Austria. E-mail: rita.stampfl@gmail.com

ABSTRACT

The project manager plays a central role in project integration and successful project completion. Leadership skills, especially knowledge-based leadership skills, are critical to project success as they enable the effective creation, sharing and use of knowledge. Project managers' social cognitive, interpersonal and strategic skills contribute to effective knowledge sharing. The Lessons Learned method is generally recommended for knowledge transfer in projects, but its effectiveness and implementation are controversial. The aim of this study is to investigate project managers' experiences with the Lessons Learned method in IT project management. The focus is on how these experiences influence knowledge transfer in IT projects. A qualitative research design was used to gain insight into the experiences of project managers. Eleven experts responsible for IT projects were interviewed in guideline-based expert interviews. The collected data was analysed using content structuring qualitative content analysis. The study found that project managers are responsible for knowledge transfer, but often do not perceive this task. Different perceptions of knowledge transfer methods were observed between traditional and agile training. The Lessons Learned approach showed unsatisfactory results and project managers defined their own methods. To improve knowledge transfer, project management standards should include clear tasks and support decision making. Generic models need to be integrated in the project management standards to ensure consistent approaches in practice.

Keywords: Lessons Learned, Knowledge Transfer, Project Management, Role of the Project Manager

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Introduction

Organisations need to develop flexible action strategies, and in order to assert themselves as an organisation, knowledge-intensive services are coming to the fore (Steinle et al., 2008). According to Schelle and Linssen (2018), project work is a way to respond quickly to emerging opportunities and challenges in the organisational context. According to the standard for project management, the PMBOK® Guide (Project Management Institute, 2021), projects are used to support the achievement of business objectives and the implementation of strategy. Project work refers to the processes and execution of work that enable the project team to deliver the expected outputs and outcomes. Project management tasks - in addition to business and planning tasks - include developing a strategy for continuous learning within a project (Lucht, 2019). Organisations should develop strategies to increase the reusability of acquired knowledge and to promote knowledge acquired in previous projects so that it can be adopted by other project teams and continuously improved over time (Zhao et al., 2022).

As early as the 2000s, study results showed that the use of knowledge transfer methods adapted to the context and content of the organisation and projects increased project success (Koskinen, 2004; Landaeta, 2008; Strohmaier et al., 2007). In their actual study, Mariam et al. (2022) found a positive relationship between knowledge-based leadership and project success via team cohesion and the moderating role of valuing people and project complexity on this relationship. This finding by Mariam et al. (2022) is supported by the study conducted by Naseem and Abbas (2022). They also found that organisational leadership and management can benefit from a better understanding of cross-project knowledge transfer, knowledge assimilation and project performance to achieve strategic goals. Lucht (2019) takes this a step further, calling for knowledge management to be integrated into internal project management. The results of these studies show that, on the one hand, knowledge transfer is considered to be important for the success of a project and, on the other hand, that difficulties are to be expected in carrying out this knowledge transfer.

In this study, qualitative research methods were used to explore this area of tension and to analyse the concrete experiences of project managers with the Lessons Learned method. This study focused on knowledge transfer in the form of Lessons Learned in IT project management.

The aim is to show existing and future project managers that knowledge transfer and the use of the lessons learned method need to be reconsidered and that successful knowledge transfer in IT projects depends on personal knowledge orientation. The empirical results of the interviews will be used to learn from the experiences of other project managers and project teams and to introduce recommendations into one's own organisational culture.

Theoretical Background

Role of project manager

The project manager plays a central integrating role within a project and is therefore the contact person for all other members of a project team. The project manager is responsible for the implementation of project management within the project and the successful completion of the project (Gareis & Gareis, 2018). In addition to project management competence, leadership skills are required for project success (Maqbool et al., 2017), including the ability to deal with the diversity, complexity and different personalities of team members in dynamic project environments. In this context, knowledge-based leadership promotes and strengthens the creation, sharing and use of knowledge to change thinking patterns and collective outcomes (Mabey et al., 2012). Extending this role description to include the aspect of concrete knowledge transfer, and taking into account Mittelmann's (2013) explanations on knowledge transfer, the project manager is responsible for defining a systematic knowledge transfer in the project and for managing the knowledge transfer. The study by Soroka-Potrzebna (2022) also confirms that project leadership is rightly highlighted as the role that often makes important decisions about the team's work, including knowledge management issues.

Li et al.'s (2022) study of knowledge sharing in project work identified three sets of skills among project managers that contribute to knowledge sharing: social cognitive skills, interpersonal skills, and strategic orientation skills. Social cognitive skills, as reported by the project managers and members participating in their study, refer to the ability of project managers to perceive knowledge differences between themselves and others, to

analyse different situations, and to develop means of reconciling the differences and achieving mutual understanding. Social cognitive skills involve project managers perceiving knowledge differences between participants to ensure that appropriate knowledge is shared in a timely manner. Project managers therefore need to analyse different situations, other project participants and the knowledge to be shared. When sharing analytical reflections and thoughts, when project managers are confronted with different interpretations from other project stakeholders, the interpersonal skill of clarification and articulation enables project managers to share their knowledge more effectively in order to be understood and to achieve shared meaning with the team. Another social-cognitive skill is the ability to select knowledge sharing channels and tools. This skill focuses on selecting appropriate knowledge sharing methods and tools to share knowledge effectively. This study therefore confirms the need for project managers to be responsible for selecting knowledge transfer methods, such as the Lessons Learned method.

Lessons Learned method for knowledge transfer in projects

The Lessons Learned method refers to learning from experience and analysing the results of past projects in order to gain important insights for future projects. This review can take place after a project has been completed, as well as during an ongoing project, and involves the analysis of documents such as status reports, meeting minutes, file notes and project diaries. The aim is to learn from the past and incorporate these lessons into future projects to reduce the risk of errors and problems and increase the chances of project success (Kotnour, 1999). According to Gareis (2006), the project completion report and experience-sharing workshops are also useful for transferring knowledge from one project to another. The data collected is kept within the organisation that carried out the project, as the team is usually disbanded at the end of the project and the knowledge holders rarely meet again in the same composition. By comparing experiences from different projects, new knowledge can also be gained across project-specific boundaries (Kotnour, 1999).

Lucht (2019) describes that Lessons Learned help the implementing organisation to access individual and collective experiences and enable the dissemination of best practices. However, there are also limitations to Lessons Learned, such as the fact that experiences are not reliable indicators of future developments, that old knowledge is preserved and that events must always be considered in the context of specific, often non-reconstructible circumstances. In addition, later projects are never fully comparable with earlier ones. Despite these limitations, the concept of lessons learnt can still be useful, as experience can be critically examined and creatively used (Mainga, 2017).

Lessons Learned method in project management standards

For the transfer of knowledge from projects to the project-based organisation, there are recommendations in the Project Management Standards, which are briefly presented and then summarised below. These standards are applied in organisations in an adapted form and provide internationally recognised certifications that are seen as training in project management.

IPMA Individual Competence Baseline

The IPMA Individual Competence Baseline was created by the International Project Management Association in 1999 and is now in its fourth version. In this standard, in the sub-process of project completion, it is stated that "the transfer of the know-how gained (Lessons Learned) to the parent organisation implementing the project and to other projects" (International Project Management Association, 2018, p.18) is a task to be performed. In the IPM ICB4 (2018), project management is encouraged to "use appropriate methods to ensure that the knowledge and experience gained during project implementation [...] is already available during and especially in the project completion phase." (p. 62). Recommended methods include sharing experiences during project meetings, conducting debriefings and experience-sharing workshops, participating in and establishing knowledge communities, and publishing articles and making available project documentation and experience reports (International Project Management Association, 2018). The IPM ICB4 is not a textbook on project, programme and portfolio management. The main focus of this document is on the individual and therefore it is a standard that specifies the competencies required for individuals to function in these business areas and achieve the intended objectives and outcomes (International Project Management Association, 2018).

PRINCE2®

PRINCE2® is the acronym for Projects In Controlled Environments and is considered the leading project management methodology. PRINCE2® is currently in its sixth edition and is a tried and tested methodology (AXELOS, 2018). In PRINCE2® (2018), the knowledge transfer tasks are stated as follows:

"The experience gained should be shared at the end of the project. If Lessons Learned do not bring about change, they have failed in their purpose - nothing has been learned from them. Each project participant is responsible for gathering experience rather than waiting for others to provide it."(p. 22).

PRINCE2® does not specify any techniques that implement this gathering and sharing of experience.

PMBOK® Guide

The PMBOK® Guide is now in its seventh edition. PMBOK is the abbreviation for Project Management Body of Knowledge and covers widespread and proven as well as innovative practices that occur in the project management discipline (Project Management Institute, 2021). Regarding knowledge transfer in projects, the PMBOK® Guide (2021) refers to its necessity in one paragraph with the following words:

"Paying attention to knowledge transfer serves the organisation by not only delivering the value for which the project was undertaken, but it also allows the organisation to gain knowledge from the experience of delivering projects." (S. 78).

No specific tasks or techniques are mentioned to ensure knowledge transfer. There is also no indication of what the knowledge will be collected for and what it will be used for.

PM²

PM² is a project management method developed by the European Commission. The aim of the methodology is to help project leaders deliver improvements and solutions to their organisations through effective management of the whole life cycle of their project. PM² is designed specifically for the needs of EU institutions and projects, but is suitable for projects in any organisation. PM² is a lightweight and easy-to-implement methodology that project teams can tailor to their specific needs (European Commission & Directorate-General for Informatics, 2021). On the topic of knowledge transfer, the PM² Guide (2021) cites the advantage of formalisation:

"Formalising Lessons Learned and post-project recommendations has many advantages. When project team members share their perspectives and provide feedback, this provides useful insights that the client side can use to make post-project activities more effective. Since all projects are different, the Lessons Learned process cannot be generalised." (p. 65).

The PM2 Guide (2021) provides concrete guidelines for the implementation of this recommendation. It is recommended that the Lessons Learned session be held as part of the Project Closure Meeting and facilitated by someone not closely involved in the project, so that project management can participate. The discussion should be structured using project phases and categories of activities as organising principles to cover all aspects of the project. The improvement ideas should be grouped so that the team can better visualise the next steps needed to implement them. In some cases, it may be useful to cover the Lessons Learned in several sessions, each dedicated to a different topic - for example, the technical issues or the business implementation. The project steering committee should be invited to the Lessons Learned sessions, as this allows members to transfer Lessons Learned to other projects.

Project management guidelines (ISO 21500:2012)

This international standard applies to all projects, regardless of their scale, complexity and duration. It provides guidelines for project management and can be used by public and private organisations alike. The standard provides general explanations of technical terms and project management procedures that are considered best practices (ÖNORM ISO 21500:2016 01 01, 2016). It is stated on the topic of knowledge transfer in the Project Management Guidelines (2016): "Throughout the project, the project team and key stakeholders identify Lessons Learned with regard to the technical, administrative and process aspects of the project. Lessons Learned should be captured, processed, formalised, stored, distributed and used throughout the project." (p. 24).

The form and techniques by which these lessons should be collected, processed and disseminated are not specified in the standard.

Summary of transfer methods and responsibilities from project management standards and norms

Following the recommendations on the subject of knowledge transfer in project management standards, it can be said that there is no single approach to aim for. Rather, there are five different recommendations when considering five different project management standards and norms. To illustrate this, the recommendations are summarised in Table 1.

Table 1.
Summary of recommended transfer methods and responsibilities from project management standards and norms

Project management standard or norm	Recommended knowledge transfer method	Responsibility for knowledge transfer
IPMA Individual Competence Baseline	Lessons Learned	Project manager
PRINCE2®	None	Each project participant
PMBOK® Guide	None	None
PM² Guide	Lessons Learned	Project Steering Committee
Project management guidelines (ISO 21500:2012)	Lessons Learned	Project team and stakeholders

Note. The classification into transfer methods and responsibility was based on the standards and norms as interpreted by the author.

It is shown in this summary that the responsibility for the implementation of knowledge transfer is also seen in a different project role for each standard or norm. A total of three standards recommend knowledge transfer in the form of Lessons Learned.

Literature Review

Knowledge transfer in projects and from projects to project-based organizations is a complex evolutionary process with many influencing factors and changing circumstances. In the study by Zhou et al. (2022) the process of knowledge transfer from projects to project-based organizations was studied with simplified variables, but the development of complex dynamic models needs further discussion. In addition, their study focuses on knowledge transfer from projects to project-based organizations, but how project managers control knowledge transfer within projects to prepare knowledge transfer to the project-based organization was not investigated in their work. Zhou et al., (2022) state that further research should focus on other elements of knowledge generation or the whole process of knowledge management of project-based organizations. Project management standards usually recommend the Lessons Learned method for knowledge transfer from projects to the project-based organizations. In contrast, the study by Paver and Duffield, (2019) on the effectiveness of Lessons Learned systems in a project, program, and portfolio management environment shows that the practice of Lessons Learned falls short of expectations and that the theory, framework, and methods underlying the practice need to be refined or changed. Their study also found that the Lessons Learned identified are superficial and there is insufficient evidence that lessons have been learned. Furthermore, the study by Paver and Duffield (2019) on the effectiveness of Lessons Learned systems in a project, program, and portfolio management environment confirms that the methods currently used in practice are inadequate.

In their study, Mariam et al (2022) found a positive relationship between knowledge-oriented leadership and project success via team cohesion and the moderating role of valuing people and project complexity on this relationship. This study confirmed that project managers should not only be knowledge-oriented, but also explicitly recognise and encourage people by valuing their knowledge, expertise, experience and contribution. This sense of appreciation and recognition will further increase their commitment to project success through stronger knowledge-based team cohesion. This study has shown that project managers' knowledge orientation, appreciation of people and team cohesion in the context of knowledge-based dynamic capabilities are required as critical factors for project success. As

a result of the study, it is suggested that project managers focus on knowledge orientation in order to build knowledge-based cohesive teams that are more cooperative and committed to the tasks in order to achieve project success to the satisfaction of all stakeholders. Based on social learning theory, the research by Nauman et al. (2022) compared and tested how two different mediating mechanisms - collaborative culture and knowledge sharing - influence the relationship between servant leadership and project team performance. As a result of this research, Nauman et al. (2022) state that team performance is a shared phenomenon and servant leaders should promote shared responsibility for collaboration among team members. Team members should share responsibility by acknowledging their mistakes, failures and weaknesses throughout the project lifecycle. In addition, leaders should foster supportive relationships among team members by focusing on communicating support, help and shared responsibility for failure to project team members. This would help to identify problems in ongoing projects at an early stage and find ways to resolve them.

Mahura and Birollo (2021) stated in their study that formal knowledge transfer practices should be the preferred way to transfer explicit knowledge, while informal practices should be used to transfer tacit knowledge. It is crucial that the project-based organisation is responsible for creating, maintaining and improving these formal practices with the main objective of transferring knowledge across projects. In their study, Barbosa et al. (2022) identified measures to promote the sharing of tacit knowledge to mitigate the effects of project turnover and ephemerality. Better team training, modern office space, diversified team compositions and meetings that focus on lessons learned are initiatives that can promote knowledge transfer in project management. Moh'd et al. (2021) conducted an exploratory configural analysis of the factors that promote knowledge concealment in project teams and found that project team members sometimes inadvertently or unintentionally conceal knowledge from other colleagues. The project culture should therefore be built under the guidance of the organisational culture. When project teams accept the organisational culture and the subcultures within projects merge with it, the potential cultural barriers to knowledge transfer can be removed and the effectiveness of transfer can be improved accordingly (Ren et al., 2019). This is supported by Srisuksa et al.'s (2021) study on the factors influencing knowledge transfer between project managers. Through this study, they found that the environment plays an important role in knowledge transfer. According to Srisuksa et al. (2022), project team members must also be motivated to transfer knowledge and have the intention to transfer knowledge. Tokede et al. (2022) therefore recommend that project managers take on the role of project facilitator to best address knowledge transfer issues in projects.

The current study

Aim and research question

The aim of this study was to collect and analyse the practical experiences of project managers in using the Lessons Learned method. The focus was on experiences in project management training and on practical experiences in the context of operational IT projects. Therefore, the current study was guided by the following research question:

- To what extent do project management experiences with lessons learned influence knowledge transfer in IT projects?

To answer this question, the epistemological interest of this research is the actual use of the Lessons Learned method by project managers in practice.

Methodology

To answer the research question, a qualitative research design was conducted to create an understanding of the experiences with Lessons Learned in IT projects. The study had an exploratory character, which is particularly appropriate when investigating a specific phenomenon that is only partially understood (Eisenhardt & Graebner, 2007). A qualitative method was preferred to a quantitative method because the former is better suited to provide insights into complex social processes (Eisenhardt & Graebner, 2007), such as the individual experiences of project managers. In addition, the rich, real-world context in which the Lessons Learned methodology takes place was to be explored. When deciding between the available methods of the qualitative research paradigm, aspects of research economics as well as aspects of the research interest and the specifics of the field - in this case IT project management - are taken into account. The interview offers many advantages, both for reasons of research economics and

especially with regard to the goal of the empirical investigation. By formulating questions in the guide, the research gaps derived in the theory part and particularly interesting aspects regarding the Lessons Learned are captured. The guideline thus ensures that the interview is focused on the research interest. The expert interviews were conducted in the form of explorative expert interviews according to Bogner et al., (2014), as this form of interview aims to collect information about the object of study and to understand the action contexts of experts. Taking into account aspects of research economics, the type of interview used was the online interview. Due to the researcher's familiarity with the research area, the interviewer as co-expert constellation was chosen as the interaction constellation for the expert interview. This resulted in a symmetrical interaction situation during the interviews, as the interviewee also had a command of the technical terminology and expertise in project management. This had the advantage of a high technical level and richness of facts, but the interviews remained in the professional frame of reference and had a high technical impact. This constellation of interactions lends itself to the exploratory approach of this research (Misoch, 2015). Depending on the underlying philosophical stance of the researcher, the interpretation of the results of the data analysis will vary, and therefore the results of the study can only be interpreted if the underlying philosophical stance is known and stated in the paper (Biedenbach & Müller, 2011). Consequently, the philosophical stance of the researcher can be described as phenomenalist, and therefore the analysis of the results of this research study aimed to create an understanding of the subjective worlds of the project managers.

Participants

The expert role is assigned by the researcher in the concrete research process. In this way, experts define themselves through their position and the knowledge attributed to them (Kaiser, 2021). In the context of this study, it can be concluded that experts are responsible for controlling IT projects and also have access to information about the project team and the decision-making processes in the project. Experts have special knowledge acquired through training, which is often documented by certificates, or by performing special activities in the organization (Misoch, 2015). To confirm the expert status of the respondents in this study, at least one valid certification from a recognized project management institute and at least five years of experience in managing IT projects were required. The term IT projects includes software development projects, enterprise software integration and implementation projects, information systems projects, IT infrastructure projects, and strategic IT projects (Tiemeyer & Bauer, 2010). The sample size was fixed at eleven persons and the detailed information about their experience and certifications is shown in Table 2.

Based on the aspects described above, this study examined the experiences with Lessons

Table 2.
Information on the interviewed experts

Person, gender	Experience with IT projects	Experience (in years)	Certification(s)
Person 1, male	Digitalisation projects, cloud projects, software development projects, business software implementation projects	19	Project Manager, cPM (pma/IPMA® Level C) Scrum Master
Person 2, male	Implementation projects, digitalisation projects, strategic IT projects	26	Senior Project Manager, cSPM (pma/IPMA® Level B)
Person 3, female	Business software implementation projects	8	Project Manager, cPM (pma/IPMA® Level C) Scrum Master
Person 4, female	Business software implementation projects	8	Project Management Associate, cPMA (pma/IPMA® Level D)
Person 5, male	Software development projects	10	Project Management Associate, cPMA (pma/IPMA® Level D)
Person 6, male	Business software implementation projects	10	PMP® - Project Management Professional
Person 7, female	Business software implementation projects, Software development projects	13	Scrum Master
Person 8, female	Organisational strategy projects, IT projects, process optimisation projects	20	Project Manager, cPM (pma/IPMA® Level C) Scrum Master Product Owner Agile Coach
Person 9, female	Business software implementation projects, data management projects	8	Scrum Master
Person 10, male	Implementation projects, software development projects	19	Project Manager, cPM (pma/IPMA® Level C)
Person 11, male	Implementation projects, infrastructure projects	24	Project Manager, cPM (pma/IPMA® Level C) Scrum Master Product Owner

Note. By signing a consent form, the experts agreed that the anonymised data listed in Table 3 may be used.

Learned of project managers responsible for IT projects in organizations as experts as close as possible to the object of study, holistically and open to theory in the specific project and organizational context of the experts interviewed. With their experiences, the experts were the focus of the research interest (Misoch, 2015). Their expertise and especially their knowledge of experience and action were presented and interpreted in the sense of applied research (Diekmann, 2021). The appropriate sampling strategy for this research design in the context of this study was homogeneous random sampling (Misoch, 2015), as the interested target group could be addressed through one channel and was to be interviewed in person during the expert interviews.

Data collection

The chosen format of the guided expert interview makes it possible to fill the gaps identified in the theory by exploring professional and expert knowledge, as well as to generate subjective impressions and interpretative knowledge in the specific context (Döring & Bortz, 2016). The explorative interview design chosen for this study required a detailed and differentiated guide, but also allowed for enough openness in the interview situation to be able to respond adequately to the interviewees. The interview guide also ensured the comparability of the content in the subsequent content analysis. Following Bogner et al. (2014), the design and details of the guide were based on the research interests and the personal research and interview style of the interviewer. The specific sequence of questions was designed in such a way that basic biographical information (education, occupation, etc.) was asked at the beginning, so that the interviewer could get a picture of the interviewee and respond individually. This was followed by general questions about the research topic, which could be supplemented by detailed questions in the course of the interview shown in Table 3 (Döring & Bortz, 2016).

Table 3.
Interview guide

1. information phase
Brief introduction to the study, purpose of the interview
2. demographic data
Education (in project management) Project management experience
3. Warm-up
What do you associate with the term project knowledge? (Differentiation of knowledge in, from and about projects). Who do you think are knowledge carriers in projects? In your opinion, what role does knowledge transfer play in project management?
4. main part
Experiences with Lessons Learned What forms of knowledge transfer were you introduced to during your project management training? What experience do you have with lessons learned? Role of the project manager To what extent do you feel responsible for managing knowledge transfer within your projects?
5. fade out
Is there anything else you would like to add or remove?

Note. The guide was used in the interview situation primarily as a memory aid and not as a reading template.

The interviews were conducted in March 2023, lasted an average of 43 minutes, and were conducted and recorded as individual interviews in Microsoft Teams. For recording, verifiable consent was obtained from each interviewee at the time of scheduling through a signed consent form. The video recordings were then transcribed using the Amberscript web platform with artificial intelligence (AI) support.

Data analysis

In order to be able to evaluate the data collected in the guided expert interviews in the form of transcripts, a content analysis was necessary. According to Kuckartz and Rädiker (2022), qualitative content analysis is "the systematic and methodically controlled scientific analysis of texts, images, films and other contents of communication" (p. 39). A distinction is made between three basic methods of qualitative content analysis: content-structuring, evaluative and type-forming qualitative content analysis. Since in the research design chosen in this research work no evaluation of the categories was to be carried out and no typology was to be created, the content structuring method was chosen. In a content-structuring qualitative content analysis, the content is structured by means of categories and subcategories (Kuckartz & Rädiker, 2022), which can be used for a structured presentation of the research findings. The content analysis category system was initially created deductively and then supplemented inductively based on the transcripts. The main categories were deductively derived from the interview guide, resulting in thematic categories

that corresponded to the structure of the interview guide (Kuckartz & Rädiker, 2022).

List of main thematic categories:

1. Lessons Learned
2. role of project manager

These main categories are closely related to the research question and reflect the aim of this study, where the role of project management and Lessons Learned were listed as a separate main category. In addition, these main categories can be used to formulate and structure the report on the findings. Type-forming content analysis can be effectively supported by QDA software (Kuckartz & Rädiker, 2022). For this reason, MAXQDA Standard 2022 was used for content analysis in this research. In the first coding process, the data material was examined according to the main categories and coded accordingly. Sub-categories within the main categories were then derived inductively on the basis of the available data. For this purpose, the main categories were differentiated by looking at all coded text passages of the main category and combining relevant dimensions into subcategories. The second coding process was then carried out according to these subcategories. Coding rules based on Kuckartz and Rädiker (2022) were used for coding. After the coding was completed, various forms of simple and complex analyses were carried out. For this purpose, category-based analyses were carried out along the main categories and correlations between the subcategories of a main category were indicated.

Results and Discussion

To present the results, the experts' statements in the categories are quoted from the content structure analysis.

Responsibilty in the Role of project managers

There was unanimity on the question of whether the experts in the role of project management feel responsible for managing knowledge transfer within the framework of projects. All of the interviewees stated that as project managers they are primarily responsible for managing the transfer, as evidenced by the following statements: "I feel 100% responsible for this" (Transcript_P9, item 53). "That is, I feel 100% responsible for making sure people know, yes" (Transcript_P9, item 51). "If I am responsible for a project as a project manager, then I am also responsible for knowledge transfer" (Transcript_P10, item 43). "Fully responsible in every aspect" (Transcript_P11, item 73). This perceived responsibility is only questioned by person 10, who additionally states: "I don't know if it is expected, but I already see it as my responsibility as project manager" (item 47).

However, a statement can not only be made about the question of responsibility, but the experts also named clear areas of responsibility that they associate with this responsibility. The first tasks to be carried out are seen in the "generation of knowledge and what is worked out in the project [...] and [...] then of course also in the anchoring of this knowledge in the respective department" (Transcript_P6, item 38). They see themselves as responsible for "distributing knowledge and making sure that everyone knows that" (Transcript_P2, item 21) and that "I [...] also initiate the project filing, the first structure, because I agree with the project team how we simply operate the communication [...] so that everyone knows how the knowledge is distributed" (Transcript_P3, item 41). In addition, it is determined how "the knowledge is written down or that one learns something from it and that it is also comprehensible what happened in the project [.]" (Transcript_P4, item 41). Person 8 describes herself "as a coordinator and as a hub" (item 40).

One interviewee stated during the interview that despite the perceived responsibility, he did not consciously take care of the management of knowledge transfer, which is evidenced by the following statement: "I would probably consider myself responsible to take care of it. Do I do it? No" (Transcript_P10, item 55). This shows that the tasks listed above are only fulfilled sporadically by the project managers and that it cannot be assumed that every project manager actually carries out the tasks in practice. During the interview, person 11 stated that it is possible for project managers to delegate these tasks: "So it is entirely up to the project manager whether he or she delegates this activity, i.e. these responsibilities, to others" (Transcript_P11, item 75).

As stated in the theoretical background, the project manager is responsible for establishing a systematic knowledge transfer in the project and for controlling the spontaneous knowledge transfer (Mittelmann, 2013), which could be confirmed by the above-mentioned statements of the experts. All interviewed persons working in the role of project managers agreed that they have

the main responsibility for managing knowledge transfer within projects. However, it was found that knowledge transfer tasks are only occasionally performed by project managers, and it cannot be assumed that every project manager actually performs these tasks in practice. The question for future projects is therefore whether knowledge transfer tasks should be considered as independent project tasks or whether they should continue to be considered as part of the overall approach. For this reason, it would make sense to anchor this topic as a separate topic in the project management standards and to clearly define this task area. These findings illustrate the need to adapt the role and responsibilities of project management.

Real training situation on Lessons Learned

A change in the theoretical and methodological framework was mentioned in the expert interviews by individuals 1, 2 and 11, who stated that the usefulness of existing Lessons Learned methods needed to be questioned and that there was a lack of a clear approach to implementation in training, as the following quotes show:

Yes, of course in training we know Lessons Learned are one way that a company develops. How exactly this happens is hardly ever taught or described. [...] Lessons Learned has become a bit of a blah-blah phrase, that you just have to do it, yes. What for? No idea. You just do it like that." (Transcript_P1, item 36) and "the so-called project documentation. So you write it down on a piece of paper somewhere and forget about it. The classic handover of the business, but not described in detail what it should look like. (Transcript_P11, item 31)

Person 2 has addressed this missing training content in more detail by referring to the transfer of tacit project knowledge as follows:

I mean that [...] this standard documentation [...] has already been emphasised everywhere. And it has been said again and again here and there, but the interesting thing would be the other not so tangible area of knowledge. From my point of view [...], there is still far too little attention paid to that. (item 27)

This view is also shared by person 11, who states that the Project Management Association (PMA) does not offer a practicable solution, but rather a theoretical path without implementation instructions, reinforced by the following statement: "In my opinion, PMA has made it too easy in the sense of yes, just take a knowledge database and that's it" (Transcript_P11, item 31).

This critical view of Lessons Learned contrasts with the results of the expert interviews with persons 6 and 7, who stated that Lessons Learned contribute to the implementing organisation's access to individual and collective experiences and enable the dissemination of best practices. Person 6 described the issue of Lessons Learned as an important part of project management training in the following terms:

That was the biggest point in the certification. That we [...] always referred to as Lessons Learned in this case, the Lessons Learned log is built up, which was not only kept at the end, but also during the entire project when things are not working so well or also when things working well, so that is what I always include, for example, that not only the things that working not well and also the things that have worked well are noted and then simply used for the next project. And that is actually also this working, that one should also adhere to such certification in order to carry out the project properly. (item 18)

Person 7 also mentioned concrete procedures that he was introduced to during the project management training: "We were introduced to various forms of knowledge transfer, how to document knowledge with various tools, like a documentation platform, a wiki, etc." (item 19).

A different perspective on the topic of methods learned in project management training was raised during the expert interviews by persons 3 and 7, who mentioned how knowledge transfer in the area of agile methods should be implemented. Person 7 stated the following:

In my last training as a Scrum Master, the answer is perhaps a little easier, because there it is supposed to be like this anyway, that the team, that is, in agile it is always the team, the whole thing where both the Scrum Master and the Product Owner actually manage the entire knowledge together, that is the principle. (pos. 19)

Likewise, person 3 stated: "In agile, of course, the daily scrum is important, for example. This daily stand-up meeting, I think, is a very important aspect for knowledge transfer. Simply because that's where the exchange and communication takes place" (item 17).

The results show that the experts have different perceptions of the knowledge transfer methods they have learned, which can be attributed to the type of training, classic or agile. In the area of classic methods, the perception is mainly unsatisfactory, whereas in the area of agile methods, the experts perceive the knowledge transfer to be more integrated into the project management procedures.

Experience with Lessons Learned

Regarding the experiences with Lessons Learned, almost all experts agreed that the method of Lessons Learned is very good in theory, but is not applied in practice, clearly formulated in the statements of person 5 and 11: "is certainly more firmly anchored in theory than it is actually applied in practice" (transcript_P5, item 23), but "the basic idea behind it is a great one" (transcript_P11, item 33). Similarly, person 10 and person 6 stated that theory and practice differed greatly. They stated that Lessons Learned "from experience, it is always a topic that is highly written in theory, but which is perhaps not always lived out in practice" (Transcript_P10, item 29) and "in fact, it does not work that way, especially when considered for the entire company" (Transcript_P6, item 20). This assessment was also confirmed by person 8. Person 8 has "unfortunately not had good experiences. Because it seeps away. It reaches the individual persons, but in the whole organisation, where there is actually a huge opportunity, it seeps away because nothing is done with it" (Transcript_P8, item 23). People 1 and 2 stated that putting the Lessons Learned method into practice has no added value. They stated that "if you [...] do it classically, there is no added value at all" (Transcript_P2, item 29) and "write down two more Lessons Learned, it's worthless " (Transcript_P8, item 23).

One possible reason for the failure of the Lessons Learned method in practice was mentioned by persons 1 and 6. They stated that in the project-based organisation there was no central steering point for the management of the Lessons Learned. Person 1 stated that "if there is no project management office in a company or someone who [...] takes care of knowledge management, then spare the Lessons Learned" (pos. 38) and for person 6 "the Lessons Learned transfer within the company [...] is rather to be judged as low, [...] but the reason is that there is not the corresponding central administration possibility to make Lessons Learned available to other areas here" (pos. 20). Another reason for the method not working was given by person 5. According to person 5 it is

> often in practice, these Lessons Learned may be very short, because then you are already in the next project and with small projects, [...] you don't take time for [...] Lessons Learned, but rush straight into [...] the next topic. (item 23)

Persons 3 and 11 stated that they had used the method of Lessons Learned several times, but person 11 "has never been in a company where these Lessons Learned were actually used" (item 33) and person 3 stated that they "make the documents available, we upload them to certain places where they are accessible, but what really happens to the knowledge afterwards is often unknown to me" (item 45). These statements show that when the method is used in practice, the theoretical procedure is satisfied in order to comply with project management standards and possible internal organisational requirements, but no benefit is apparent for the project management. Person 10 confirmed this interpretation by stating: "in the end it is actually lost knowledge" (item 29) and "that is certainly a huge deficit" (item 53).

Persons 7 and 8 stated that they had very good experiences with Lessons Learned "when the team culture is right" (Transcript_P7, item 23). Person 8 was the only interviewee who stated that they had "definitely always had positive experiences" (pos. 23), "because it is also a very excellent element for project completion" (pos. 23).

These results show that although the Lessons Learned method is used in practice, the majority of project managers do not see any added value. The Lessons Learned method taught in theoretical project management training is implemented in practice only to a limited extent, if at all, and does not deliver the added value for project-based organisations predicted by project management standards. These results also confirm the findings of Paver and Duffield (2019) on the effectiveness of Lessons Learned systems in a project, programme and portfolio management environment and show that the implementation of Lessons Learned has remained below theoretical expectations.

It can be concluded that the lack of a central administration and the lack of time are responsible for the failure of the Lessons Learned method. The experts confirmed that a knowledge-oriented organisational culture and a steering

project-based organisation are necessary in order to implement knowledge transfer through Lessons Learned.

Conclusions

Regarding the research question about the influence of project managers' experiences with Lessons Learned on knowledge transfer in IT projects, it can be stated that all project managers know the method and have already used it in practice. The majority of project managers have not had any positive experiences with Lessons Learned and do not see any added value in its application for IT projects. This has led to project managers defining their own methods for knowledge transfer. It can be deduced from this that no clear procedure on how to deal with knowledge transfer is implemented in IT projects, but that subjective decisions on knowledge transfer are made by the project manager. The project managers have found very individual and situational solutions to ensure knowledge transfer and to replace the Lessons Learned method. Accordingly, the experience gained with the method has a clearly recognisable influence on the management of knowledge transfer and the handling of knowledge in IT projects.

For consistent approaches to be applied in practice, generic models and frameworks need to be integrated into project management standards. The Lessons Learned approach, which is still taught in its current form and is part of certification exams, is outdated and has been shown not to deliver the desired results in practice. The Lessons Learned approach needs to be replaced by methods and procedures that include clear tasks for knowledge transfer and support project management in decisions such as the concrete distribution of knowledge. In addition, the standards need to identify possible measures for creating internal organizational guidelines and schemes for knowledge transfer within project-based organizations, and clarify their necessity for organizations. This would ensure that future organizations consider the associated knowledge transfer from the outset when implementing project management standards and processes, and do not priorities projects solely on the basis of content, cost and time.

Limitations and future directions

A limitation of this study is that the expert interviews were conducted with the interviewer as co-expert, which resulted in a strong technical bias. Here, the interaction constellation of the interviewer as co-expert could have been chosen to increase trust with the experts and thus obtain more confidential process knowledge (Misoch, 2015). In addition, the researcher herself is part of the field under study, so prior knowledge influenced the research design and practical implementation. This may have led to certain phenomena being taken for granted and therefore not considered in the research design. Later research could clarify these ambiguities by having the interviews conducted by a person who is not part of the field, as this person's lack of knowledge can be used to obtain more comprehensive explanations from the experts.

The economic framework of the research limited the research findings in that the strategy of theoretical sampling could not be implemented due to time constraints, and therefore theoretical saturation was not achieved and the maximum theoretical insight value could not be obtained from the interviews. These limitations could be mitigated by conducting additional interviews to achieve representativeness of the findings in terms of content. From a methodological point of view, the work is characterized by paradigmatic aspects of the chosen qualitative content analysis and thus limited in its knowledge gain, especially from the point of view of the proponents of the quantitative paradigm. Another limitation is that this work focuses on the IT project management perspective. The results of this study are also limited by and related to the project management perspective. Only experts with experience in IT projects were interviewed. Further research could include the perspective of project management in other areas or the perspective of the various project stakeholders and the project-based organization.

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ORIGINAL RESEARCH PAPER

THE EFFECTS OF A LEXICAL APPROACH-BASED EFL PROGRAM USING MOODLE AND STUDENT ATTITUDES TOWARDS IT

Isabella Tinkel

***University of Applied Sciences Burgenland**, Eisenstadt, Austria*

Correspondence concerning this article should be addressed to Isabella Tinkel, University of Applied Sciences Burgenland, Eisenstadt, Austria. E-mail: isabella.tinkel@fh-burgenland.at

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ABSTRACT

This exploratory-sequential mixed method study aims at investigating the impact of a specially designed Lexical Approach-based teaching program on the use and recognition of lexical chunks. Participants came from full-time and part-time Bachelor's degree programs at Universities of Applied Sciences in Austria. The relationships between the use and recognition of lexical chunks and the semester participants attend (2nd, 4th, 6th) and their mode of study (full- or part-time) were examined. Additionally, the usefulness of Moodle for teaching the Lexical Approach was investigated. Quantitative data was collected by using questionnaires and by testing participants' productive and receptive knowledge of lexical chunks through appropriate tasks. Qualitative data was obtained by conducting guided interviews. Results show that the exposure to the Lexical Approach was perceived as very relevant and useful by the learners. The same is true for the accompanying Moodle activities. Also, part-time students from higher semesters seem to be even more likely to profit from the teaching program focusing on the Lexical Approach. This implies that integrating the Lexical Approach into English language teaching is a most beneficial undertaking to support and improve learners' EFL performance.

Keywords: English language learning, lexical approach, student attitudes, Moodle, learner autonomy

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1. Introduction

Foreign language learning is a complex and ambitious process that demands time, dedication and suitable learning strategies on the part of the learner, as well as the teacher, to succeed. According to Michael Lewis, the creator of the Lexical Approach, especially the area of lexical chunks (LC) is crucial to this learning process. And, although this part of language is known to be "potentially limitless, and heavily constrained by the learners' experience" (Swain and Carroll 1987), it is also the basis for building any foreign language competence as, "without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (Wilkins 1972). Hence, building a wide range and extensive scope of vocabulary is paramount. Thus, it is essential to pay attention to the words themselves, to the co-text these words exist in, as well as the many meanings depending on the context in which they are used (Supasiraprapa, 2019).

Thus, LC – i.e. common word combinations – are an integral part of language learning and learners' awareness of these should be raised. The increased usage and recognition of LC in the learning process can lead to better EFL performance, including grammatical structures. Lewis states that "a central element of language teaching is raising students' awareness of, and developing their ability to 'chunk' language successfully" (Lewis 2012b). Educator Barbara Oakley supports this idea saying that all information is more easily retained and accessible if absorbed in chunks (Exeter, 2016). Recent research (Tinkel, 2022) sought to shed further light on how a teaching program designed with a special focus on teaching the theory of the Lexical Approach as well as extensive work with LC can influence English language learning development at a tertiary level. Results show that especially recognition of LC is influenced positively by enhancing learners' ability to chunk language correctly.

In order to support this beneficial ability of chunking and, therefore, raising awareness of the Lexical Approach and giving learners practice of LC, Moodle can be used. Although not originally designed for language teaching, it provides many useful tools and activities to enforce engagement with LC (Silva et al. 2016 as cited in (Cabero-Almenara, Arancibia, and Del Prete 2019). Moodle quizzes and journals are excellent interactive learning tools that engage learners by simultaneously being game-like and informative (Urbonienė & Koverienė, 2013). Learners find such activities helpful due to the option of repetition of exercises, of providing a change from traditional tasks and the ability to 'physically' engage with the content by, for example, moving items on the screen (Deissl-O'Meara & Tinkel, 2021).

The current study aims at exploring in more detail the individual perceptions of participants regarding the usefulness of this Lexical Approach-based teaching program for their English language learning journey through the analysis of interviews conducted with several students who were exposed to the treatment. Furthermore, the relationships between the recognition and usage of LC fostered by the Lexical Approach-based teaching program and the semester the participants attend (2nd, 4th or 6th) and their mode of study (full- or part-time) were examined.

2. Research Questions

In order to explore the research problem of this study, four research questions were formulated.

RQ1: What are the personal perceptions of participants regarding the usefulness of the Lexical Approach for (English) language learning?

RQ2: What are the personal perceptions of participants regarding the usefulness of Moodle activities to support learning to work with lexical chunks?

RQ3: Is there a statistically significant relationship between the semester students attend and the usage and recognition of lexical chunks?

RQ4: Is there a statistically significant relationship between mode of study and the usage and recognition of lexical chunks?

3. Literature review

3.1 The Lexical Approach and its relevance for language learning and teaching

The Lexical Approach posits that "language consists not of traditional grammar and vocabulary but often of multi-word prefabricated chunks" (Lewis 1997) and that acquiring a new language requires learners to make the new language their own and transfer concepts from their native language into the new language (Lewis, 2012b). This latter effort in particular qualifies the Lexical Ap-

proach as a deep learning strategy necessitating learners to make an increased cognitive effort to embed concepts deeply into the long-term memory (Sagarra & Alba, 2006) and, thus, make learning more sustainable. Various research (Abdellah, 2015; Debabi & Guerroud, 2018; Fahim & Vaezi, 2011; Falahi & Moinzadeh, 2012; Seesink, 2007; Webb & Kagimoto, 2009) has shown that explicit instruction regarding the Lexical Approach and LC, increases learners' ability to identify, record, remember and reuse these prefabricated units of language. Yet, explicit knowledge about the theoretical underpinnings of the Lexical Approach or on how to work with LC is often not readily accessible to learners (Abdellah, 2015).

Results of research focused on introducing learners explicitly to the theory of the Lexical Approach (Tinkel, 2022) showed that especially the area of recognition of LC was most positively influenced by a Lexical Approach-based program which led to a 2.29 increase in the mean score of the experimental group between pre- and post-test. Such an effect was also found by Falahi and Moinzadeh (2012) when an experimental group exposed to receptive tasks focusing on collocations was able to double its score between pre- and post-test. This shows that the mere presence of LC-oriented tasks in learning materials (Lewis, 2012a) does not automatically mean that learners are aware of and able to process these tasks efficiently and effectively. However, a teaching program, which focused specifically on building awareness of the Lexical Approach and working with LC, influenced participants' ability to recognize them positively (Tinkel, 2022). Equally Fan (2005) who conducted research on acquisition of verb-noun collocations found that participants taught about the Lexical Approach performed better in recalling LC and identifying them than those who only concentrated on memorization.

The area of usage of lexical chunks has also been shown to be affected positively by explicit focus on these items. Research (Tinkel, 2022) found that the experimental group also outperformed the control group in this area by 1.59 after being exposed to the Lexical Approach-based program. Especially the area of strong (very fixed) LC was observed to have been influenced most positively. This was also found in studies where participants given special collocation training outperformed those without such training in the use of strong collocations (Debabi & Guerroud, 2018). In the same vein, learners who were introduced to the Lexical Approach increased the use of their strong LC with the treatment (Siyanova-Chanturia, 2015). Falahi and Moinzadeh (2012) and Webb and Kagimoto (2009) conducted studies including productive tasks focusing on specific verb-noun collocations to be used in cloze exercises. Both experiments revealed that these tasks targeting the production of LC did support the improvement of participants' overall knowledge of collocations.

All these studies confirm that "chunking is the mother of all learning" (Exeter, 2016) and that further investigation into the benefits of the Lexical Approach in language teaching is essential – not 'only' for the improvement of the language learning journey but also because the Covid-19 crisis has accelerated online education, forcing Universities of Applied Sciences to embrace learning management systems such as Moodle for English language teaching (Bozkurt, 2020).

3.2 Using Moodle to teach working with lexical chunks

Moodle has become the most widely used distance learning software employed by Universities of Applied Sciences in Austria (Moodle, n.d.). Although not originally made for language teaching, Moodle is a useful tool in the increasingly digital English language teaching environment, as it can foster (inter)active and flexible learning experiences (Silva et al., 2016 as cited in (Cabero-Almenara, Arancibia, and Del Prete 2019). 93% of a sample of 213 students enrolled in an English course using Moodle to support learning found the platform had a positive impact on their learning ((Suppasetseree and Dennis 2010).

Despite its obvious benefits and the widespread use of Moodle for English language teaching, the topic of specifically employing it for teaching LC has not yet received much attention. Yet, 78.57% of students involved in a Lexical Approach-based teaching program found Moodle tasks were (very) beneficial for engaging with LC (Deissl-O'Meara & Tinkel, 2021). The activities used supported students' ability to extend their range of vocabulary and general language skills in an enjoyable fashion. This was accomplished through an increased awareness of LC supported by Moodle tasks. (Seesink 2007) also used Moodle with great success in her study exploring how to enhance the study of collocations in writing. Indeed, participants' texts featured more collocations after the language course supported by Moodle activities.

Another study examined individual modules and their popularity among learners and providing resources (67%), assignments (59%) and quizzes (57%) were most popular, whereas forums (28%) and chats (21%) were least popular (Urbonienė & Koverienė, 2013). This was partly confirmed by Deissl-O'Meara and Tinkel's (2021) study where quizzes were by far the most suitable activity for practicing LC, which is consistent with (Suppasetseree and Dennis 2010) who state that 97% of their participants rated quizzes as useful for language learning. Equally, (Gonzalez-Vera 2016) found 90% of participants appreciating the self-assessment quizzes offered through Moodle. Equally, the journal function used by students to collect LC outside the classroom resulted in more engagement which helped learners retain LC better and internalize the concept further (Deissl-O'Meara & Tinkel, 2021).

As can be seen, Moodle has been used successfully for English teaching and to support the teaching and practice of the Lexical Approach. Since all students are largely exposed to some online activities, it is necessary to explore possible connections between full- and part-time degree programs and the semester students are in and LC performance.

3.3 Mode of study and lexical chunks performance

It can be assumed that, in general, adults registering for a part-time study program will be well-established in work-life, while those choosing a full-time program will be younger and will possibly have graduated from school recently. This is valid for the data used in this study. Only 6 students were between 18 and 22, but 29 were between 23-33 among those who studied part-time. In contrast, among the full-time students, 59 participants were in the 18-22 age group compared to 15 in the 23-33 age bracket. In this regard, English performance – and LC performance, to a certain degree - can be tied to the age factor.

It is encouraging that, especially in the lexical domain, older learners may have an advantage over younger peers (Hellman, 2008) since all participants involved in this study are adults. Such 'lexical superiority' might be attributed to the more advanced cognitive maturation process and a better awareness and command of meta-linguistic abilities. Moreover, older learners may already have more learning strategies at their disposal (Burgo, 2006; Lichtman, 2013), having had more time to explore different options. It has been found that older learners seem to prefer deeper learning strategies which require active engagement with the language they are learning, while younger learners tend to favor shallower approaches such as mere memorization of lexical items (Schmitt, 1997). In extension of the sustainability related benefits of deep learning strategies, among which the Lexical Approach can be counted, (Lichtman 2013) discovered, while teaching an artificial language to adults and children, that both age groups benefitted from explicit instruction. (Kojic-Sabo and Lightbown 1999) state that the use of more elaborate strategies usually denoted higher lexical achievement. This aligns with the advantages of adult learners when it comes to cognitive abilities and meta-linguistic awareness. Furthermore, it supports results found by (Tinkel 2022) that participants in the older age range in the experimental group did outperform the slightly younger participants in the area of recognition of LC ($p = .001$).

In addition to the age factor, participants' status as "working" or "only studying" may influence their ability and/or willingness to engage with the Lexical Approach. Research (Cheng, 1995; Stern, 1997) has claimed that learners working part-time are more likely to achieve lower grades or even abandon their studies because increased working hours may affect academic achievement negatively. With relation to this study, it is assumed that most part-time students work full-time and, thus, this would indicate that the large number of hours dedicated to work could influence their performance quite negatively. This would be underlined by findings that state a negative impact of full time work affected 39% of the students examined (Furr & Elling, 2000). However, it has been suggested that part-time work could affect the performance of older learners less negatively than that of younger learners (Barone, 1993) due to the fact that coordinating work and academic studies requires learners to be more efficient and better organized in their learning (Dundes & Marx, 2006) – a goal that is also supported by knowledge of the Lexical Approach since this can enhance independent language learning. Therefore, I hypothesize: there is a statistically significant relationship between mode of study and the usage and recognition of lexical chunks.

In connection with their mode of study and the possible age-related influences, students' willingness to engage with LC as a new language learning tool might also be related to the semester

they are in when they were introduced to the Lexical Approach. Here, the age factor and the progression in language learning regarding length of exposure to English may also be relevant.

3.4 Semester attended and lexical chunks performance

When it comes to the influence of the semester that participants attend on their ability to use and recognize LC, research in the area of exposure to language becomes relevant. Of course, the aforementioned age-related factors contribute, as it may be assumed that in each program (part-time or full-time) students in higher semesters will be slightly older than learners in lower semesters. However, this must not be taken for granted and it has been argued that exposure to any language in an institutionalized environment may not be the most optimal indicator for achievement. This is supported by research such as DeKeyser (2000) who discovered that adult immigrants speaking Hungarian as their mother tongue did not reach the same language competence as learners who had arrived in the foreign country in childhood and went through school. Similar to this effect of age of first exposure, learners' use of English outside the classroom may also contribute significantly (60-70%) to their language competence as "large exposure to a language plays a significant role in English learning and teaching. It helps a lot in such cases where learners have a great opportunity to practice outside the classroom" (Tonoian 2014).

Thus, the semester attended by the participants in this study might not be an ideal indicator of their overall English competence but may still serve as a useful comparison factor when it comes to the specific skills of using and recognizing LC. In this vein, a study (Galiansa et al., 2020) among Indonesian students found a strong, significant and positive correlation ($r = 0.646$, $p < 0.01$) between English language exposure and reading comprehension. In the context of this study, this competence would be related to the recognition of LC. Therefore, I hypothesize: there is a statistically significant relationship between the semester students attend and the usage and recognition of lexical chunks.

In connection with the use of lexical chunks a study by (Parina and Leon 2013) may support the hypothesis that more exposure to English will entail increased usage. It found that participants, who were exposed to English more often or had more access to language resources, were more confident in writing. Naturally, confidence in writing does not automatically relate specifically to the use of LC, but, given that practicing a language more will embed its phrases better in the long-term memory, those two variables could be connected. Numerous studies have confirmed the positive effects of increased exposure on language competence (Ellis, 2002; Politzer, 1965).

4. Methodology

The purpose of this study is to expand upon the research investigating the usefulness of the Lexical Approach in EFL teaching. The Lexical Approach has been incorporated into much of the available English learning and teaching material (Lewis, 2012b). Since learners are mostly not aware of how to use LC most effectively and efficiently (Abdellah, 2015), the unique focal point of this specially designed teaching program was the transfer of a basic theoretical knowledge of the Lexical Approach before working with LC extensively in- and outside the classroom. Through a comparative pre-post-test quasi-experimental design (McMillan, 2012) this study examined the relationship between the usage and recognition of LC and semester attended and mode of study. Guided interviews were conducted to investigate personal perceptions of participants in the experimental group regarding the perceived usefulness of the Lexical Approach as well as the Moodle activities used in the teaching program.

4.1 The participants

Participants of the study attended two Universities of Applied Sciences in Austria. All subjects took Business English classes as part of the 2nd, 4th or 6th semester of their Bachelor degree programs in economics and were either full- or part-time students. Since the groups were fixed, convenience sampling was employed, which is often the only feasible method in educational contexts to gain an insight into existig relationships (McMillan, 2012). Additionally, participation in the research had to be voluntary due to legal regulations.

Out of the 86 participants who gave information regarding semester attended and their mode of study, 45 were in the 2nd, 30 in the 4th and 11 in the 6th semester. 37 attended the full-time program and 49 were registered in the part-time program (Tab. 1).

Table 1.
Descriptive Analysis of Participants

Variable		n	%
Semester	2	45	52.3
	4	30	34.9
	6	11	12.8
	Total	86	100
Mode of study	full-time	37	43,0
	part-time	49	57,0
	Total	86	100

4.2 Qualitative method – guided interviews

In order to examine personal perceptions of participants exposed to the Lexical Approach-based teaching program, guided interviews were conducted online with four students. All interviews were recorded with the consent of the participant and then transcribed and approved by the participant. Interviews were done after the end of the semester and the release of the English grade in order to ensure maximum honesty and voluntariness of participation. The main questions investigated focused on the usefulness of LC for language learning (e.g. "Do you find the knowledge of lexical chunks helpful/not helpful for learning English?") and on the effectiveness of Moodle activities for learning about and working with LC (e.g. "Did you find the Moodle activities helpful/not helpful to practice lexical chunks?"). All interview transcripts were coded and two categories were created – LC and their usefulness and Moodle activities and their usefulness. The LC category contained eight codes (e.g. LC create a positive feeling) and the Moodle activities category comprised three codes (e.g. activity types).

4.3 Quantitative method

4.3.1 Instruments and procedure

To explore the relationships between usage and recognition of LC and mode of study (full- or part-time) and semester attended (2nd, 4th or 6th), data was collected through an online questionnaire administered via Moodle before and after administration of the Lexical Approach-based teaching program. In the first part of the questionnaire participants provided information on biographical data (e.g. age, gender) and other variables (e.g. semester, mode of study). In the next two sections participants were asked to, first, compose a short text on a given topic (covered in class) to provide a basis for assessing their usage of LC. Second, for the assessment of recognition of LC, participants filtered LC from a short text passage taken from 'Collocations in Use Intermediate' by (McCarthy and O'Dell 2017).

During the semester, participants in the experimental group were taught through a specifically designed program, featuring an introduction to the basic theory of the Lexical Approach and extensive work with LC through different task types used in class and via Moodle. Due to the Covid 19 pandemic, classes were conducted exclusively online.

4.4 Data analysis

Data was analyzed through the Statistical Package for the Social Sciences 26.0. Descriptive data was obtained through calculating frequencies, means and standard deviations. Before testing the hypotheses, the assumptions for the application of multivariate statistical procedures related to normality, linearity, homoscedasticity were tested and confirmed (Mertler & Vannatta Reinhart, 2016). The hypotheses were tested by employing, One-Way MANOVAs and, where appropriate, post-hoc Bonferroni tests.

4.4.1 Analysis of the lexical chunks usage task

A small learner corpus containing the texts written by the participants was created using the software AntConc (Anthony, 2019). All nouns, verbs and adjectives were filtered according to matches with the Oxford 3000 (Oxford, 2008) and all lemmatized collocates within 4 words left/right were computed. Only collocations with a minimum frequency of 3 were considered and included in the analysis of noun-adjective, noun-verb and verb-adjective collocations. These were compared to the Corpus of Contemporary American English (COCA) (Davies, 2008) to assess whether they were "real and authentic" collocations. All matches were recorded and counted.

4.4.2 Analysis of the lexical chunks recognition task

The receptive task was analyzed manually according to the key provided in the source material – 'Collocations in Use Intermediate' by (McCarthy and O'Dell 2017). The collocations recognized

by participants were compared to the ones provided in the book and only the matching ones were counted and recorded.

5. Results and discussion

5.1 Personal perceptions regarding the usefulness of the Lexical Approach

Research question 1 investigated the personal perceptions of the participants regarding the usefulness of the Lexical Approach for (English) language learning.

All participants agreed that the idea of LC is highly useful for English language learning. The benefits of LC were seen in various areas. Most dominant was the area of confidence and security when handling the English language. One participant explicitly remarked that they "learn a little bit easier and lexical chunks support me also in […] English learning" and another stated that "they [LC] instill confidence". This also became apparent in the statement, "I feel more comfortable when I write something […] because I know that's correct". As indicated, the productive skills of speaking and writing were also found to be supported by knowledge of LC, confirming the results of research (Tinkel 2022). Here the experimental group fared better at retaining strong LC and at increasing their usage after the treatment when compared to the control group. The statement that, "with writing a text I pay attention to lexical chunks, so it makes the text way nicer and sound more professional", is testament to this benefit of LC for writing. Speaking also received attention regarding the benefits of LC. Participants said that it provided them with security of expressing themselves properly and with more confidence. Therefore, as also found by (Rizvić and Bećirović 2017)), LC were also deemed useful for anxious learners as they provide ready-made language to rely on. One interviewee stated that "[Speaking] is easier because then they know lexical chunks […] and [they] make them more confident".

The positive effect of the Lexical Approach-based program on the recognition of LC was measured in research where the experimental groups' mean scores rose by 2.29 between pre- and post-test, outperforming the control group by 1.92 (Tinkel, 2022). Similarly, interviewees confirmed that knowledge and awareness of such LC facilitates reading. One participant said that "I'm more aware of it [LC] because when I read something, I'm looking for these collocations, but I didn't do that before this semester". Another even said that their "understanding of texts [is] much better than before." This increased awareness of LC and the better processing of information ties in with range of vocabulary and grammar knowledge. Interviewees confirmed that the program has supported them in this area by not learning just one word but "you learn a phrase and you can use it all the time […] and you can keep it easier in your mind." Equally, it was stated that if they had been aware of this concept sooner "I would have been better in English, and it would have been easier for me to learn new vocabulary." Participants also picked up on the coexistence of grammar and vocabulary (Lewis, 2012b). One person stated this explicitly, saying, "You do learn grammar too. For example, I'm looking forward to meeting you. And the first thing was why to and then the ing-form? It makes no sense. So then you look it up then you make sure okay, it works."

These statements do not only underline the proven usefulness of the Lexical Approach-based program but also confirm Barbara Oakley's (Exeter, 2016) claim that chunking is probably the most effective way of learning. This statement is further underlined by the results obtained in the interviews where the benefits of the Lexical Approach for learning languages in general were mentioned several times, describing LC as "the way to go" after obtaining some basic knowledge of a language. Further confirmation of the usefulness of the Lexical Approach for English language learning was provided by one participant who stated that they would be using the concept in the future independently and that they had even started teaching it to their younger sibling who also found it very helpful.

It has been stated that the Lexical Approach is omnipresent in much of the teaching material available but that learners are often not aware of the underlying principles and, thus, cannot draw the maximum benefit from these exercises (Abdellah, 2015). In this vein, participants' interviews also revealed that they appreciated the introduction of this "tool" so they have the opportunity to integrate it into their learning.

5.2 Personal perceptions regarding the usefulness of Moodle tasks related to lexical chunks

Research question 2 concerned itself with the personal perceptions of participants regarding the usefulness of Moodle activities to support learn-

ing to work with LC. Similar to the positive results related to the general usefulness of LC, the Moodle activities employed in the teaching program were also rated as beneficial and absolutely necessary to complete such a program. In accordance with previous research (Deissl-O'Meara and Tinkel 2021) it was shown that four main areas were positively influenced by the use of Moodle activities in the Lexical Approach-based program – "practicing lexical chunks, general feeling of support for language learning, increased motivation and engagement through gamification and the opportunity to increase their vocabulary size and scope."

Quizzes were rated as the most useful by the interviewees with cloze and matching exercises being most popular. This was confirmed by statements saying that it was helpful to "find lexical chunks and to complete sentences with them." Matching different parts of a LC was also well-received, as was the use of the journal activity outside the classroom. Learners' task was to find LC and record them in their Moodle journals, which was "very important because you just sit down and rethink what have you learned, what have you used." Further, the gamification of the learning process was also appreciated (Gonzalez-Vera, 2016; Urbonienė & Koverienė, 2013) because participants felt that online exercises provided a change to traditional exercises and were a good way to engage in a friendly competition with classmates, which also increased enjoyment and motivation. Participants also found that the activities were "always something new for the lexical chunks and you got to know new lexical chunks so it was really helpful and I really enjoyed it."

In conclusion, it can be said that both the idea of lexical chunks as well as the Moodle activities employed to engage with them were received positively by the students. This confirms the usefulness of teaching the Lexical Approach and providing students with sufficient practice to integrate this new tool into their arsenal of learning strategies. This might be easier for some learners than for others and the reasons for this might be diverse. Two factors which might influence learners' ability and/or willingness to engage with the Lexical Approach are the semester students are in and their mode of study.

5.3 The relationship between semester attended and lexical chunk performance

Research question 3 is focused on the investigation of the relationship between the semester students attend and the usage and recognition of LC. Consequently, the hypothesis proposed that there is a statistically significant effect of the semester participants were in (2^{nd}, 4^{th}, 6^{th}) on the usage and recognition of LC. A one-way MANOVA was conducted to test this hypothesis.

Results revealed that there was a significant relationship between semester students attend and the usage and recognition of LC Wilks' Lambda $\lambda = .878$, $F(4, 164) = 2.761$; $p = .029$, with a large effect size $\eta^2 = .63$. Follow-up univariate ANOVAs confirmed the significant relationship between semester and the recognition of LC $F(2, 83) = .5.694$; $p = .005$; $\eta^2 = .121$. There was no significant relationship between semester students attend and the usage of LC $F(2, 83) = .061$; $p = .941$, $\eta^2 = .001$. Post hoc comparisons using the Bonferroni test indicated that the mean score for recognition of LC in semester 4 ($M = 10.23$, $SD = 3.49$) was significantly different to semester 2 ($M = 6.73$, $SD = 4.93$). Yet, semester 6 ($M = 8.36$, $SD = 4.32$) did not significantly differ from semester 4 or 2 in the recognition of LC (Tab. 2).

Table 2.
Recognition of LC & Semester Mean Scores

Semester	Adjusted M	Unadjusted M
2	6.73	6.73
4	10.23	10.23
6	8.36	8.36

This means that recognition of LC was particularly positively affected in semester 4. These numbers indicate that the ability and willingness to work with the Lexical Approach and use this knowledge effectively for recognizing LC increases with progression of the studies. This claim is supported by the fact that, although there were 45 participants in the 2^{nd} semester compared to 30 in the 4^{th} and 11 in the 6^{th}, the participants from the higher semesters outscored 2^{nd} semester students. This corresponds to findings stating that older learners perform slightly better than younger learners in the lexical domain (Hellman, 2008). Correspondingly, research (Tinkel, 2022) discovered that the older age group (23-33) outperformed the slightly younger age group (18-22) in the experimental group in rec-

ognizing LC. Their mean scores increased by 2.89 while the control group's score dropped by .38. Research focusing on Indonesian students also found a strong, significant and positive correlation ($r = 0.646$, $p < 0.01$) between English language exposure and reading comprehension (Galiansa et al., 2020). Similarly, (Al-Zoubi 2018) found that exposure to English had a positive correlation ($r = 0.228$, $p = 0.037$) with the development of all four language skills.

Concerning the usage of LC, mean values are relatively similar across all semesters, thus, there was no significant effect. Still, participants in the 4th semester topped the scores with 6.97 (SD = 3.56), followed, surprisingly, by semester 2, with 6.71 (SD = 5.06) and semester 6 with 6.45 (SD = 3.83). Despite the absence of a statistically significant relationship, the performance by semester 4 students can be regarded as partly supporting the conclusion that working with LC becomes easier as students progress in their studies. This relates to research by (Parina and Leon 2013) who found that learners, who were more exposed to English or had more access to language resources – here the duration of their studies – were more confident in writing. Granted, confidence is not necessarily an indicator for the usage of more LC. However, as has been stated by interviewees, LC do have the potential to support confidence building.

5.4 The relationship between mode of study and lexical chunk performance

Research question 4 is concentrated on exploring the relationship between mode of study and the usage and recognition of LC. Thus, the hypothesis proposed that there is a statistically significant difference in the usage and recognition of LC based on mode of study (full- or part-time). A one-way MANOVA was performed to test this hypothesis.

Results showed a significant effect of mode of study on usage and recognition of LC Wilks' Lambda $\lambda = .816$, $F(2, 83) = .9.375$; $p < .001$, with a large effect size $\eta^2 = .184$. Univariate ANOVAs confirmed a significant effect of mode of study on recognition of LC $F(1, 84) = 17.723$; $p < .001$; $\eta^2 = .174$ (Tab. 3). Contrarily, the effect of mode of study on usage of LC $F(1, 84) = .2.304$; $p = .133$, $\eta^2 = .027$ was insignificant.

Table 3.
Recognition of LC & Mode of Study Mean Scores

Mode of study	Adjusted M	Unadjusted M
full-time	5.95	5.95
part-time	9.84	9.84

These results suggest that the program is more effective in strengthening the recognition of LC. Mean values showed that the part-time students outperformed the full-time students by 3.89, scoring 9.84 (SD = 3.20) compared to 5.95 (SD = 5.32). The fact that the part-time students did better with recognizing LC could be related to their higher age, contributing to their increased ability to process the theoretical information provided in the program. This corresponds to the possible advantages of more mature learners in the lexical area (Hellman, 2008; Tinkel, 2022) Full-time students tend to be younger and, therefore, might not yet be prepared for a new, meta-cognitive approach to language learning. These results support research that attributes a preference for more complex, deeper learning strategies, such as the Lexical Approach, to older learners, while younger learners lean towards shallower strategies (Schmitt, 1997). Waldvogel's (2011) study examining Spanish L2 learners in the U.S. Military confirmed this as higher scores corresponded to the use of more meta-cognitive learning strategies.

Regarding the usage of LC part-time students also outscored the full-time students despite the absence of a statistically significant relationship. The difference lay at 1.44 in favor of the part-time students whose score was 7.39 (SD = 4.52), compared to the full-time students with 5.95 (SD = 4.14). These findings also support the idea that higher age might positively affect the ability and willingness to employ the Lexical Approach. These results might also mean that students working part-time might be better at organizing themselves through strategies that support efficient learning (Dundes & Marx, 2006) and that older students suffered fewer negative consequences caused by working alongside their academic efforts (Barone, 1993).

In summary it can be said that studying part-time seems to be beneficial as the positive effects of the Lexical Approach-based teaching program can be realized and accepted – especially in the area of recognition of LC. Still, usage is affected positively and, thus, as was suggested by the positive relationship with a higher semester attended,

part-time students with assumed higher age, can draw significant benefits from being taught the Lexical Approach.

With regard to the limitations of this study, it must be said that, despite the beneficial effect of the Lexical Approach-based program on the recognition of LC in higher semesters and among part-time students, the exposure to the program (approx. 4 months) might be relatively short to firmly anchor this new "tool" in students' minds. Yet, positive responses regarding the usefulness of LC in English language learning obtained in the interviews are encouraging and suggest that over a longer period of time, such "anchoring" could be achieved. Another aspect to be considered is the individual student's motivation and willingness to consider adopting a new approach to language learning. Frequently, learners have become so comfortable with their established learning strategies that they do not readily engage in exploring a new and, at the outset, more cognitively demanding strategy such as the Lexical Approach. Still, as mentioned above, more exposure to the concept could lead to more adoption of the concept.

6. Conclusion

This research sought to dive deeper into learners' personal perceptions regarding the Lexical Approach-based teaching program. Results showed the positive impact of the program on awareness and appreciation of the Lexical Approach among learners and the corresponding better recognition of LC. Likewise, benefits related to confidence in the areas of speaking and writing were pointed out. Furthermore, Moodle and a variety of activities have been shown to be highly useful for both, learners and teachers, when conveying knowledge of and practicing LC. The game-like nature of tasks and a change from the traditional exercises provided in the classroom were perceived as helpful to increase motivation and engagement with LC.

It can also be established that, while all participants profit from the Lexical Approach-based teaching program, part-time students in higher semesters seem to do so more. This might be due to their higher age, presumed longer exposure to the target language and slightly more advanced meta-cognitive abilities which allow them to process and embrace deeper, more complex learning tools better.

To conclude, it has been shown, in this research that the Lexical Approach is a highly useful learning "tool" to offer to learners in tertiary education so that they may take control of their learning in as efficient a way as possible. Thus, further research should focus on using the Lexical Approach-based program throughout the entire course of a degree program to ensure maximum exposure to LC and a higher likelihood that students will integrate this tool into their language learning toolbox. This would significantly support language learning as it would indeed fulfil Michael Lewis' wish to teach learners how to chunk language correctly and, thus, learn more efficiently. And learners do seem to understand this importance, which was demonstrated by one interviewee summarizing the need for the Lexical Approach to be integrated explicitly into language teaching, "Why don't teachers come up with such things if they know they exist? […] if you learn a foreign language, you need the teacher to teach you how to do it, not just learn the words. Learning a language is much more than just putting one word after another."

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ORIGINAL RESEARCH PAPER

THE ATTITUDES TOWARDS THE USE OF ANGLICISMS IN THE CROATIAN LANGUAGE OF MEDICINE

Anamarija Gjuran-Coha[1], **Tajana Tomak**[2]

[1] ***University of Rijeka***, *Rijeka, Croatia*
[2] ***University of Rijeka***, *Rijeka, Croatia*

Correspondence concerning this article should be addressed to Anamarija Gjuran-Coha - anamarijagc@medri.uniri.hr, University of Rijeka, Rijeka Croatia.

ABSTRACT

In this research paper, we will explore the laypersons' attitudes towards the use of Anglicisms in medical language. Some communication difficulties may arise between patients and their doctors because patients' knowledge of medicine and medical terminology is insufficient. Therefore, they often remain uninformed and misunderstood.

A questionnaire-based study was carried out among 100 laypersons in Rijeka, Croatia. It aimed to explore understanding, acceptance, use, and need for Croatian equivalents, which show their attitudes towards using Anglicisms in medical communication. The findings show some statistically significant differences in terms of understanding and use of Anglicisms with respect to the age of the respondents and the level of their education. The respondents mainly justify the use of English medical terms in medicine when there is no adequate Croatian equivalent. However, a high percentage of them support the need for creating Croatian equivalents, which should be more understandable and transparent than the English ones. We can conclude that Anglicisms are widely used in the Croatian medical language, but the Croatian equivalents should be created in collaboration between doctors and linguists.

Keywords: the language of medicine, medical terminology, Anglicisms, loan words

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1. Introduction

English has become the most widespread language in the world, *lingua franca,* due to the dominant role of the United States of America in the fields of science, technology, commerce, business, and culture. The use of English has been growing in all national languages due to the (new) information that it carries (Maher, 1986: 208). A field in which English has been a contributor of terms is that of medicine and the health sciences. The impact of English on other languages has been largely investigated, but it usually showed the linguists' attitudes towards linguistic borrowing. The attitudes of average speakers have been somewhat neglected. Some authors notice that the interest in wider public perception of Anglicisms and their native equivalents should be greater (Picone 1996). Anglicisms have been widely studied in the Croatian language as well. Croatian linguists were under a strong influence of language purism due to the fact that Croatian was, for most of its history, exposed to strong foreign influences, and that was a way of protecting and preserving the linguistic and national identity and independence (Turk, Opašić 2008: 81-82). Some authors notice that the use of Anglicisms clearly reflects Croatian speakers' snobbery, indifference, conformism, and spiritual laziness, which might eventually lead to forgetting who we are (Babić 2004; Opašić 2006). However, Anglicisms are not understandable to people of different social classes, ages, and educational levels. It is especially evident in medical communication, in which Anglicisms and foreign words are used in order to fill a lexical gap. The communication in the doctor-patient relationship should be clear and non-ambiguous. In this communication, the patient is always inferior due to the scarce knowledge of medicine and poorer linguistic competencies. In today's modern technology world, speakers are oriented to Internet information and media sources which borrow English terms. It frequently leads to misunderstanding and confusion. For example, during the Covid 19 pandemic, the term *booster vaccine* was incorrectly interpreted as "the third dose". It led to confusion in public opinion. The correct translation would be "dodatna ili dopunska doza" - *additional dose*.

The aim of this paper is to investigate the attitudes of Croatian lay persons towards the use of Anglicisms in the language of medicine.

2. A review of previous research in Croatia and some European countries

Although researches on Anglicisms in medical language are scarce, the ones related to the standard language have been carried out in Croatia and in other European countries. Drljača Margić (2012) conducted a questionnaire-based study among 244 students at the University of Rijeka. The study's findings indicate that today's presence of Anglicisms is predominantly seen as an inevitable and expected phenomenon but also as a manifestation of linguistic snobbery. The present use of Anglicisms in Croatian is also perceived to result from the lack of the popularization of their native equivalents. The minority of the respondents fear language or identity loss and relate the present use of Anglicisms to the un(der)development of the Croatian language. Penjak and Karninčić (2017) explored whether the strength of a country's national identity can determine extensive use of English instead of Croatian equivalents among Croatian students of kinesiology, both in their professional (expressions related to sport) and everyday language usage. The results show a negative correlation between the strength of national identity and the knowledge of Croatian equivalents. In 51% of cases, in sports terminology, students do not know the native word and 78% prefer using English sports terms. Also, the strength of one's national identity does not influence better knowledge of Croatian terms or their frequency of use. Matić (2013) carried out research to investigate the ICT students' attitudes towards Anglicisms and their Croatian equivalents in computer magazines. The results show that the English element and unadapted forms in ITC magazines are, on average, not only accepted but preferred among students, while the Croatian adaptations of Anglicisms are dispreferred. Skopljak and Dubravac (2019) conducted research among 200 adult Bosnian speakers to explore the impact of English as the global language and the use of English words in Bosnian. The analysis revealed that English has gained a prominent status in Bosnia and Hercegovina, not rarely being preferred over the native structures with similar or equivalent meanings. The majority of the respondents claimed to gain regular exposure to English, either in written or spoken form. The results also indicate that the younger the participants are, the more preference for English expressions they show. Panić-Kavgić (2006) carried out

research among 80 adult Serbian speakers. The results show a relatively low level of understanding of Anglicisms, as in half of the participants, the meaning of the word was unfamiliar. In the questionnaire survey of Endrštova (2010), 165 Czech respondents from three generations took part. Noticeable differences in language attitudes among age groups were confirmed. The results suggest that older generations tend to have rather negative attitudes towards the borrowings. The younger respondents' assessment of English borrowings was markedly positive. Consequently, they are less concerned about the future of their mother tongue. A small number of speakers regard English borrowings as beneficial to their mother tongue, as only one in four respondents viewed Anglicisms as an enrichment of Czech. However, a large majority of survey participants appeared to especially appreciate the role of English loanwords in specialized terminologies. In Slovakia (Panocova 2020), the attitudes to borrowings from English find a place between two poles. On the one hand, there are Slovak users (not only linguists) who are strongly against borrowings, especially Anglicisms. Some even consider them a serious threat to Slovak as a national language which is part of Slovak identity. On the other hand, some users are keen to use English words in their Slovak. Sanchez and Sirpa (2014) focus on the opinions and judgments of 15 randomly selected native Finnish speakers with regard to the use of Anglicisms in Finnish and other cultural-linguistics-related issues, including technology, social media and healthcare. Their data were collected through surveys and interviews and show divided opinions. On the one hand, despite general accepted use of Anglicisms, 3 Finnish participants hold negative views towards these borrowings. Specifically, these speakers think that using Anglicisms instead of their equivalent native words is a "shame", that their widespread use may bring "social inequality", and that English is "taking over" Finnish. On the other hand, the other 12 speakers think that by being "open and flexible" one can "work its way" through situations where English is not only helpful but also necessary. Taking gender into account, they found out that 3 out of 4 men in the group had moderate purist attitudes regarding the influence of English in Finnish. The 11 women were fully welcoming that influence. The authors relate it to the gender paradox in sociolinguistics, which states that women usually conform more closely to linguistic norms but they can be initiators of linguistic change.

3. The present research

3.1. Objectives

The aim of our research was to investigate the laypersons' attitudes towards the use of Anglicisms in medical language. Our goal was to investigate the intelligibility of the English terms, their linguistic acceptability, frequency of use, and the need to create Croatian equivalents with respect to age and education. The respondents had the possibility of suggesting native equivalents to English terms. Furthermore, we also investigated the use of Anglicisms in doctor-patient communication and everyday speech.

3.2. Materials and methods

3.2.1. Participants

The research was conducted in Primorje-Gorski Kotar County, Croatia, in the period from April to May 2021. The study was conducted using an anonymous survey. Respondents were randomly selected.

The group included 100 respondents, who were divided according to education and age. 56 respondents had a university degree (high education levels), and 44 respondents had attended secondary school. According to age, respondents were also divided into three groups: up to 30 years of age (21), from 31 to 50 (45), and over 50 (34). From the above data, it is evident that middle-aged respondents predominated in the age group. All the respondents were native speakers of the Croatian language.

3.2.2. Methods

The study was conducted by an anonymous survey with the aim of collecting data related to the respondents' attitudes towards the use of Anglicisms in the Croatian medical language. The questions were constructed with fixed response options and unstructured (or semi-structured) response options.

The survey consisted of two parts.

The first part of the survey contained 16 Croatian sentences taken from medical publications (Medicina fluminensis, Liječnički vjesnik, Medix, Narodni zdravstveni list) in which the English term was used to note a concept. The respondents were asked to state whether they understand the mean-

ing of the term, how often they use it, whether the term is linguistically acceptable and if there is a need to create native equivalents. The second part of the survey contained 13 statements aimed at exploring attitudes and opinions using English terms in doctor-patient and everyday communication. The survey used a quantitative and qualitative approach in order to examine the relationship between the examined variables and investigate the significance of the obtained results. Out of descriptive statistical indicators, arithmetic median values and standard deviations for the variables were calculated. Chi-square test was used to calculate the differences in answers. To be more clearly illustrated, the obtained results are presented graphically.

3.3 Results and discussion

Table 1 shows the relationship between the respondents' age and the understanding of English medical terms, the use of these terms, and the need to create Croatian equivalents.

Respondents aged 31 to 50 years have significantly more correct answers than those over 50. There are no significant differences between other age groups. Respondents of the three age groups did not differ significantly in their assessment of the understanding and use of these terms and the need for Croatian equivalents.

This result is according to our expectations since younger and middle-aged speakers are more skilled in foreign languages, and their knowledge is better. There is a statistically significant difference in the number of correct answers between respondents aged up to 30 years and from 31 to 50 years compared to the respondents over 50. Namely, the respondents of the first two groups have a significantly higher number of correct answers than the respondents of the third group.

First, we explored the relationship between the age of the respondents and their understanding of the English term. There is no statistically significant difference between the respondents and the result is almost the same in all three test groups. However, according to the chart, the result is slightly higher in the 31-50 age group. It can be attributed to the fact that the respondents of the middle-aged group have learned English from an early age, and to some extent they are familiar with the terminology. In addition, they use the Internet and are up to date with developments and technology in general.

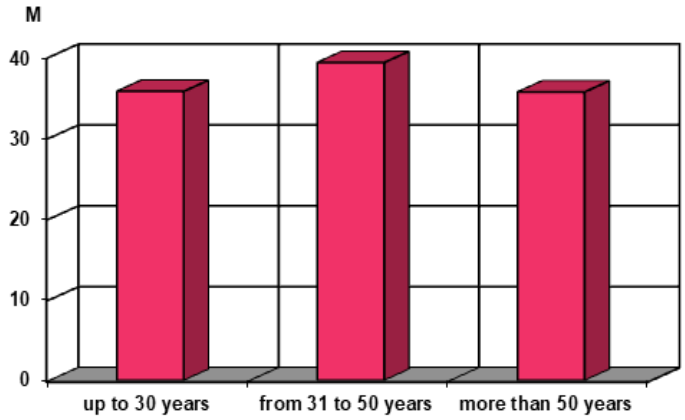
Table 1.
The relationship of age with the total number of correct answers, understanding of the terms, the use of these terms, and the need for native equivalents

AGE groups	M	SD	F ; p
TOTAL NUMBER OF CORRECT ANSWERS			
1. up to 30 years	2,25	2,05	F = 3,48; p = 0,037 2 > 3
2. from 31 to 50 years	2,58	3,12	
3. over 50 years	0,83	1,44	
UNDERSTANDING OF THE TERM			
1. up to 30 years	35,73	8,66	F = 2,15; p = 0,13
2. from 31 to 50 years	39,29	5,28	
3. over 50 years	35,65	7,04	
THE USE OF THE TERM			
1. up to 30 years	19,27	3,52	F = 0,91; p = 0,41
2. from 31 to 50 years	21,13	4,60	
3. over 50 years	19,89	4,54	
THE NEED FOR CROATIAN EQUIVALENTS			
1. up to 30 years	5,73	1,85	F = 1,23; p = 0,30
2. from 31 to 50 years	5,85	2,38	
3. over 50 years	6,70	1,66	

There is also the influence of the media, which uses English to a great extent. It is also the age at which people pay more attention to their health, and knowledge about medical topics is acquired in various ways. There are certain Croatian publications in which authors try to get closer to readers in terms of language, so they define foreign medical terms or explain them descriptively, thus bringing medical topics closer to readers. (See Figure 1) Compared to the results of Panić-Kavgić

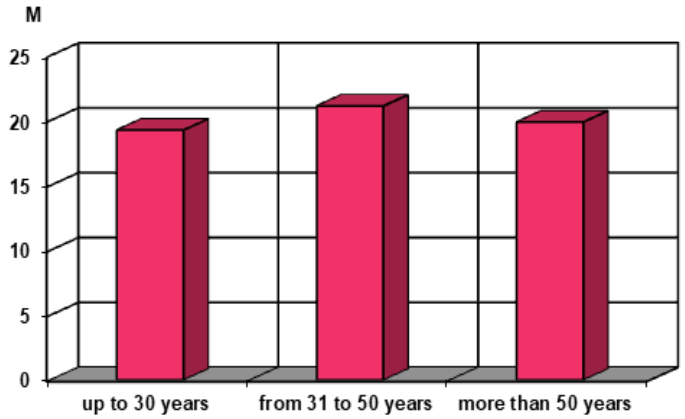
(2006), whose participants showed poor knowledge of Anglicisms, as 50% of participants did not know the meaning of the words, Croatian speakers show far better results than Serbian ones. This difference can be explained by the fact that the Serbian research was conducted 15 years earlier.

Figure 1.
The relationship between the age of the respondents and the understanding of the terms



The use of English medical terms with respect to age was examined. The results between the three age groups did not show statistically significant differences, although the group aged 31 to 50 showed a slightly better result than the other two. Respondents aged 31 to 50 are more likely to use certain English medical terms than the other two. It was expected, given that the respondents in this group better understand English terms, so they use them as such. (See Figure 2)

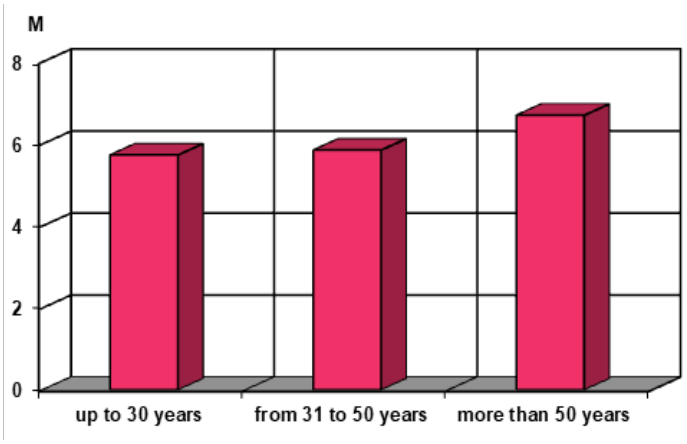
Figure 2.
The relationship between the age of the respondents and the use of the terms



Our results correspond to those reported in Dubravac (2016), as the younger participants were those who preferred English words, and the older ones rather opted for the native equivalents.

The following results show the relation between the age of the respondents and the need for Croatian equivalents. We expected that older respondents would show a greater need for Croatian equivalents since the understanding and use of foreign terms were significantly lower than in the other two groups. Although there is no statistically significant difference between the three groups, the need of respondents over 50 for Croatian terms is slightly higher than in other groups of respondents. Since they have a poorer understanding of English terms, we expected they would show a greater need for Croatian equivalents. (See Figure 3) Our results are similar to those found in Skopljak and Dubravac (2019), who suggest that younger generations tend to be those who readily accept new words, growing up with them, while the older generations tend to rely more on the native language, probably not being familiar with all the expressions popular nowadays.

Figure 3.
The relationship between the age of the respondents and the need to find Croatian equivalents



In addition to age, respondents were also divided into two groups according to their education: higher education and secondary education, and we obtained statistically significant results.

Table 2.
The relationship between respondents' education and the total number of correct answers, understanding of the terms, use of the terms, and the need for a native equivalent

VARIABLES	1. HIGH EDUCATION		2. SECONDARY EDUCATION		t; p
	M	SD	M	SD	
TOTAL NUMBER OF CORRECT ANSWERS	2,38	2,76	1,09	1,99	t = 1,98; p = 0,052
UNDERSTANDING OF TERMS	40,14	4,54	33,86	7,32	t = 3,55; p = 0,001 1 > 2
THE USE OF TERMS	21,87	4,23	18,38	3,57	t = 3,20; p = 0,002 1 > 2
THE NEED FOR NATIVE EQUIVALENTS	5,97	2,28	6,40	1,73	t = 0,72; p = 0,47

The difference in the total number of correct answers between respondents with high and secondary education is at the borderline of statistical significance (p = 0.052). There is a tendency for respondents with a university degree to achieve a significantly higher number of correct answers. Highly educated respondents assess their understanding and use significantly higher than those with secondary education. There is no significant difference between the respondents with high and secondary education in the assessment of the need for Croatian equivalents.

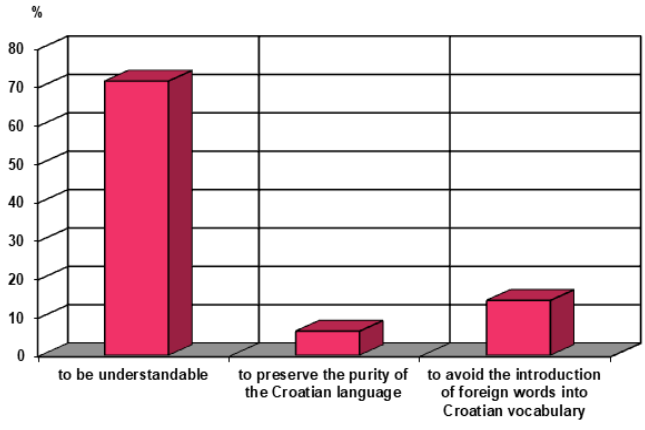
We first investigated the relationship between education and the total number of correct answers. We expected the respondents with high education to achieve better results, which was proven by this research. Namely, respondents with high education had a significantly higher total number of correct answers, and the result itself is on the border line of statistical significance. It is clear that education has an impact on the knowledge of foreign languages because we assume that the respondents have continuously learned a foreign language and used it in their profession and additional training.

The relationship between respondents' education and understanding of English terms is also explored. The results show that, in this case, there is a statistically significant difference between respondents with high education and secondary education. Namely, the respondents of the first group understand English much better than the respondents of the second group and therefore use it more often. We expected that education would play a major role in understanding and using English terms. If the term appears frequently and speakers understand its meaning, they tend to use it as well. However, if they do not understand, the situation is reversed, and the foreign term is not used.

Finally, the relationship between the respondents' education and the need for a Croatian equivalent was examined. We expected a statistically significant difference between the two groups, but it was not recorded. Both groups equally expressed the need for native equivalents, which proves that respondents, regardless of education, are more likely to use Croatian terms.

The second part of the survey referred to the attitude of respondents towards the words of English origin, the frequency of their use, their use in everyday speech, and the reasons for the daily influx of new English words into the language of medicine and the need to translate them. The first question referred to the reasons why medical terms need to be translated.

Figure 4.
The reasons why English terms in medical terminology should always be translated

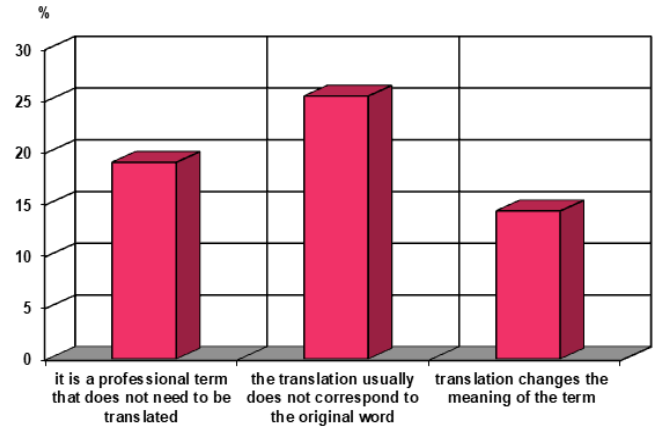


The results show that the incomprehensibility of the foreign term is one of the most substantial reasons for its translation. As many as 71.4% of respondents think that it is necessary to translate English medical terms to be understandable. 14.3% of respondents state that translation prevents foreign words from entering the Croatian vocabulary.

Only 6.3% favor purist tendencies of the Croatian language, which is achieved by creating Croatian equivalents. These data show that the intelligibility of a foreign term and the clarity of its meaning are the most important for the speakers. In medical communication, it means that the patient should be clearly informed about his/her condition. (See Figure 4)

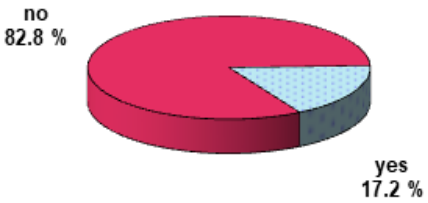
The next question addressed the reasons why English medical terms do not always need to be translated, and we obtained the following results. The most significant number of respondents (25.4%) think that the translation usually does not correspond to the original word, 19.0% of them believe terminology should not be translated, and according to 14.3% of respondents, translation changes the meaning of the term. These respondents' attitudes should not be commented on because laypersons are not competent to evaluate professional medical terminology, but it should be judged by an expert from a certain field. (See Figure 5)

Figure 5.
The reasons why English medical terms do not always need to be translated



When asked about the linguistic acceptability of the translated English terms, 82.8% of respondents stated that the translated terms are not linguistically acceptable, while 17.2% stated that they convey the same meaning. The survey results are surprising because they show that the respondents' interest in medical terminology is greater than we thought and that they follow all changes and innovations in the language of the medical profession. This attitude of the respondents should be an additional motivation for physicians and linguists to create appropriate Croatian equivalents. An example is the "centar za zdravlje" as the offered Croatian equivalent for the English terms *wellness center*, which was assessed by the vast majority of respondents as linguistically unacceptable and inappropriate. Linguistically, the term pattern "adjective + noun" would be more acceptable, i.e., "zdravstveni centar", but semantically it does not correspond to the English term. (See Figure 6)

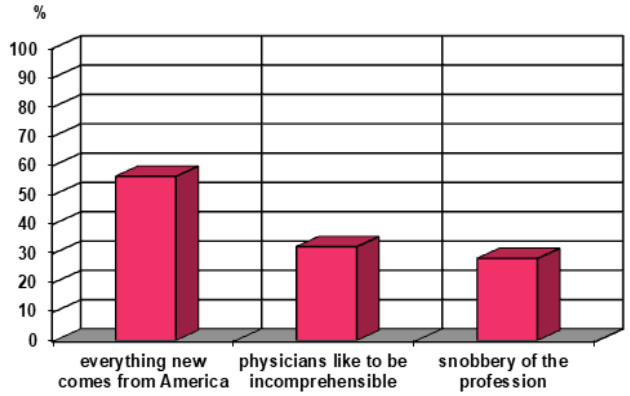
Figure 6.
The opinion on whether translated English terms are always linguistically acceptable



Regarding the reasons why there are more and more terms of English origin in medical terminology, 56% of respondents think that everything new comes from the USA and the presence of English is inevitable. As many as 32% think doctors like to be incomprehensible and use foreign terms. 28% think that the main reason for that is the snobbery of the profession.

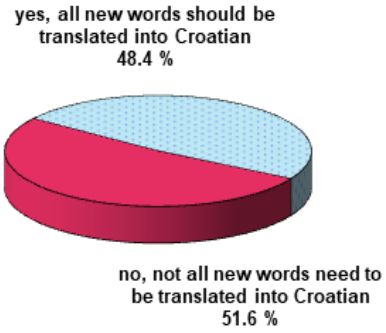
Such a high percentage of respondents who believe that all innovations come from the States is not surprising because it is quite clear that the USA, with its scientific and medical achievements, occupies the first place in this field. However, we were surprised by the respondents' opinion that physicians, by using foreign terms, tend to be incomprehensible. Namely, according to the principles of medical ethics, physicians should use vocabulary that is accessible and clear to patients, but obviously, our participants do not share such experiences. As for the snobbery of the medical profession, almost 30% of respondents associate English terms in the medical profession with doctors who use them. (See Figure 7) Similar results regarding linguistic snobbery are reported in Drljača Margić (2012), suggesting that most respondents hold that the use of Anglicisms indicates linguistic snobbery among Croatian language speakers.

Figure 7.
The reasons why there are more and more words of English origin in medical terminology



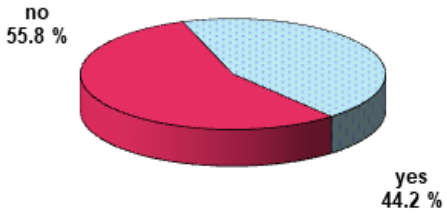
Regarding the daily influx of new English terms, the respondents' opinion on whether all words of foreign origin should be translated into Croatian, the respondents are divided: 48.4% of them think that all new words should be translated into Croatian, while 51.6% think that they should not. We think that age has had a decisive influence on this issue, as the older respondents are more likely to translate English terms, while the younger ones use the English terms more. (See Figure 8)

Figure 8.
The opinion on whether all new words of foreign origin should be translated into Croatian



When asked about their opinion on the linguistic acceptability of loan translations, 55.8% of respondents think that English terms are not well translated, while 44.2% accept the translation. We expected this result since the attitude of the respondents was divided. It can be attributed to age but also education. Younger and highly educated respondents state that Croatian medical equivalents are vague and incomprehensible (such as the Croatian equivalent for *AIDS – kopnica* or *tjelesni pretražnik - body scanner*) and are more likely to accept the English term. Some English terms are already widely accepted as *face lifting*, *bypass*, *fitness*, *anti-age program,* and so on, and as such, are used regardless of the existence of the native equivalent. (See Figure 9)

Figure 9.
The opinion on whether English terms are well translated into medical terminology



The next question is closely related to the previous one and refers to the respondents' opinions on whether translations retain the same meaning as English terms. As many as 61.0% of respondents think they do not, while 39.0% think they do. Namely, it is clear to the vast majority of respondents that English medical terms are translated spontaneously. We registered different translations of one term, e.g., *informed consent* - some translate it as *informativni pristanak*, the second as *informirano suglasje*, and the third as *informativna suglasnost*, while the patient does not understand what it means and is in doubt as to which term to use.

Regarding the creation of medical terminology, 79.4% of respondents think physicians and linguists should jointly participate in creating new loan translations, 11.1% would entrust this task exclusively to physicians, and 9.5% to linguists. Such a result clearly indicates that the respondents are well aware that only joint cooperation between the two can lead to the creation of Croatian equivalents. It should be achieved as soon as possible for the respondents to resolve their doubts about choosing the appropriate term.

We investigated the respondents' opinions on the free acceptance of all words of foreign origin in the Croatian language. In this case, the opinion is also divided, so 50.9% of respondents think that the Croatian language should freely accept all words of foreign origin. In comparison, 49.1% insist on language purity and, therefore, do not accept all foreign words. The research results show that respondents are generally not burdened by linguistic

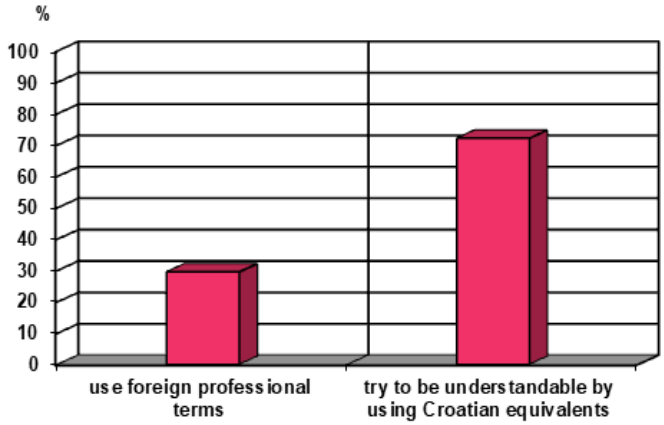
purism, and tend to accept and use words of foreign origin and, thus, English terms. However, a certain measure should be found because almost half of the respondents want to spare the Croatian language from unnecessary foreign influences. (See Figure 10)

Figure 10.
The opinion on the freedom to accept words of foreign origin in the Croatian language

Regarding the communication with the doctor, i.e., whether physicians use foreign medical terms in their communication. 72.1% of respondents think that physicians try to be understandable by using Croatian equivalents, while 29.5% think that physicians use foreign medical terms. This is encouraging information that shows that physicians, despite the tendency to frequently use foreign medical terms in their communication with patients, choose how to approach them. Language is an important means of making close contact. We find that even for an educated patient, the following sentence is completely incomprehensible: »Intravitalna dijagnoza rupture disecirajuće aneurizme torakalne aorte». (Intravital diagnosis of rupture of a dissecting thoracic aortic aneurysm.) (See Figure 11)

The last question referred to the respondents' personal assessment of Anglicisms and in everyday communication. The result surprised us because 92.5% of respondents use Anglicisms, while only 14.9% use Croatian words. This is another proof of the significant influence of the English language on Croatian because over 90% of respondents of different ages and education use English words under the strong influence of the media and the Internet. It corresponds to the conclusion of Skopljak and Dubravac (2019) that English is widely used as a common means of communication.

Figure 11.
The evaluation of the use of foreign professional names in communication between physicians and patients



4. Conclusion

This study shows a strong impact of Anglicisms on the language of medicine. According to the results, understanding of Anglicisms and their use is most common in the age groups up to 30 years and from 31 to 50, which was according to our hypothesis. Namely, these are younger or middle-aged people who use the Internet, follow the healthcare literature, and keep up with the times. Since Anglicisms are present everywhere, they are inevitable in medical terminology as well.

A small percentage of respondents do not understand the meaning of Anglicisms and therefore consider it necessary to create their Croatian equivalents. We expected this since it is a language for medical purposes. Although lay persons may know English well, this does not mean that they will understand medical terms and interpret them correctly, especially in certain branches of medicine, such as radiology, molecular biology, genetics, and proteomics, where almost all terms are English.

In everyday speech, all respondents use English, which proves our claim about the presence of English in all spheres of life.

Regarding the need for a native equivalent, respondents agree in large numbers that it is necessary to create Croatian equivalents of English medical terms in order to be clear and understandable to speakers. This is also expected as the intelligibility of the term is very significant.

The vast majority of respondents agree that both physicians and linguists should be involved in the formation of the Croatian equivalents, while a very small number of respondents would entrust it to physicians. These results lead to the conclusion that the standardization of medical terminology is necessary to avoid confusing situations for both physicians and patients. Great efforts are being made in the standardization of many professional terminologies due to the initiative of STRUNA, a project of the Institute for Croatian language and linguistics.

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CHALLENGES AND RISKS OF (IN)ADEQUATE LINGUISTIC STRUCTURES IN REPORTING ON SUFFERING IN ISRAEL, PALESTINE, AND UKRAINE – THE CASE OF BILD.DE

Belma Polić[1], **Nihada Topovčić**[2], **Emina Horić**[3]

[1 2 3] ***University of Zenica***, *Zenica, Bosnia and Herzegovina*

Correspondence concerning this article should be addressed to Belma Polić, University of Zenica, Zenica, Bosnia and Herzegovina. E-mail: belma.polić@unze.ba

ABSTRACT

This paper is the result of monitoring articles from online media in the German language on current topics. Given that the Israeli-Palestinian conflict is currently the central topic of the world media, a linguistic analysis of the texts on the mentioned topic was carried out, from 07. 10, 2023, when the horrific murders of Israel citizens took place, until 22. 12. 2023. The focus is on the analysis and comparison of linguistic means used to describe suffering of civilians, treating in more detail their morphological, semantic, and stylistic features. The results of the research show whether adequate language expressions and structures are used in reporting on the war casualties of civilians in Israel, Gaza, and Ukraine, where the focus is on civilians in Israel and Gaza. All examples were taken from the German portal bild.de, considering that it is the most read portal in Germany.

Keywords: linguistic analysis, online media, (in)adequate linguistic structures, reports on the war, Israel, Palestine

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Introduction

This paper is a result of analyzing online-media articles in German on current topics. Given that the Israeli-Palestinian conflict is presently the central topic of all the world's media, we decided to conduct a linguistic analysis of texts on the above-mentioned topic, from 07. 10. 2023, when the terrible murders of Israeli citizens took place, to 22. 12. 2023. The focus of the paper will be on the analysis and comparison of the linguistic means used to describe the suffering of civilians, as well as on their morphological, semantic, and stylistic features. Based on the results obtained, it will be established whether adequate language expressions and structures are used in reporting on the war sufferings of civilians in Israel, Gaza, and Ukraine, with the focus on civilians in Israel and Gaza.

All examples were taken from the German website Bild.de, which is the most read website in Germany[1]. Texts analyzed fall into the category of journalistic-publicist style used by journalist and publicists, and in addition to the written media is also used in the spoken media such as radio and television (cf. Hudaček & Mihaljević, 2009; Silić, 2006). The previously mentioned style is led by the idea that „journalism as neutral, as a transmitter of facts" (cf. Steensen, 2017, p. 26) is obliged to adhere, primarily, to objectivity. Genres that imply objectivity and neutral language have an informative function. This group includes the news, commentary, chronicle, review, interview, poll, and reporting. The aim of this research is to point out possible risks and challenges based on a detailed linguistic analysis of the ways of describing civilian war suffering, with a focus on their (in)adequacy, and in order to achieve journalistic objectivity with the help of adequate vocabulary. For the purpose of writing this paper, all articles describing the suffering of the Israeli and Palestinian civilians from 07. 10. 2023. until 22. 12. 2023, as well as, if necessary, articles describing civilian war sufferings in Ukraine, were observed and analyzed. Pairs of words which appear in the articles and which are related by their semantic features were singled out. Those pairs are:"töten"/"sterben"/"massakrieren/Massaker"; "Kinder"/"Minderjährige"; "Opfer"/"Zivilisten".

Theoretical background

The language of the media nowadays directs the way of thinking and reasoning of the media users. It also influences lifestyles and forms linguistic habits of its recipients. The journalistic style, used in the media, is achieved through several genres, depending of the content and purpose of the text. Therefore, it is a demanding task to assess the (in)adequacy of the language used by the media to address its users.

Addressing the primary task of journalism and the language of the media, Kovač and Rozenstil argue that "journalism has the key task of providing people with the information they need to be free and participate in self-governance" (2006, p. 17). Scientific research (Martinić, 1994 & Chomsky, 2002; Jurčić, 2017 et al) on the influence of media is diverse. Some hold that media has positive impact on the user while others argue it has a negative impact. However, the fact is that the media in today's society has an impact on the actions and development of the modern man, primarily in terms of obtaining information about events in the society, information relevant to a person's existence and proper functioning.

Speaking of possible inadequate reporting of the media, postmodernist Jean Baudrillard (1998) points out that people are nowadays influenced by the media and that they do not have their space of reality because the media places them in the universe of "simulacrums". Baudrillard further claims that media is responsible for creating the spectacle, due to simultaneity, and the spectacle in the media leads to a lack of empathy and consideration. Chomsky goes a step further and claims that the media today plays an important role in controlling and monitoring the masses, adding that such an "indoctrinating" role of the media has crept into educational apparatuses with the aim of misinforming.

The influence of the language of the media on forming its recipient's thinking was, precisely, the reason to investigate the language of the most read online media in Germany (Bild.de) from a linguistic point of view. The focus is on Bild.de's reports on the current topic in Israel and Gaza. Given that the topic is recent, there are few studies that thematise the above-mentioned topic. However, there is certain linguistic research that contributed to the creation of ideas and concepts for this research, such as *The Construction of Refugees and Asylum Seekers in German Print Media* (Schmidbaur, 2016/2017), *Why do news values matter? Towards a new methodological framework for analysing news discourse in Critical Discourse Analysis and beyond* (Bednarek

1 https://www.similarweb.com/de/top-websites/germany/news-and-media/ (Accessed 23rd December 2023)

& Caple, 2014), and particularly *Online news media framing of the 2021 Israeli-Palestinian conflict by Al Jazeera, BBC and CNN* (Rizova & Panayotova, 2021).

Linguistics in this case has the task of approaching the targeted texts analytically and critically, and the task of exposing the (in)adequacy of reporting on the previously mentioned topic by relying on a scientific methodology. The aim of the paper is also to provide impulses for examining the background of such reports and to give answers on why certain potentially inadequate strategies are present in language and what their implication are. The book *Sprachkritik* (2018) was consulted on the matter of critical discourse analysis.

Research methodology

This research is the result of analyzing the excerpted materials from the most read German online web page Bild.de. All texts describing the suffering of civilians in the conflicts in Israel and Gaza were collected, in the period from October 7th to December 22nd 2023. A total of 50 examples were excerpted, which were then translated into English. Translations can be found in the footnotes of this paper. All texts were analyzed at semantic, morphological, syntactic, etymological, and stylistic levels. The examples are divided into groups/pairs based on semantically close words, which describe the suffering of civilians. The first group contains examples in which the words kill/die/massacre appear, with this group also including the noun "massacre" from which the verb massacre was created by conversion. The first group, therefore, refers to the words that describe the loss of human life. The following pair is children/minors, where the mentioned words were excerpted, described, analyzed and compared. The last pair refers to the suffering of civilians, where sometimes the word civilian is used, and sometimes the word victim. This prompted us to analyze examples in which the suffering of innocent citizens is described using these words. Renowned lexicographic sources were used for etymology and accurate semantics, as well as for the analysis at the morphological-syntactic and stylistic level. In this part of the paper, the following universal dictionaries were used: Duden (2006), German-Croatian universal dictionary (2005) (hereinafter referred to as NJHUR), Anić's dictionary of the Croatian language (2004), and the Dictionary of the Bosnian language of the Language Institute (2007) (hereinafter referred to as RIZ). Examples describing the suffering of civilians in Ukraine are taken as an illustration and for comparison in terms of describing the same suffering in Israel and Gaza.

Analysis of examples of selected pairs of words

In this part of the paper examples are presented. They are classified into three groups, based on semantically similar words that describe the suffering of civilians, namely: töten/sterben/Massaker, massakrieren, Kind/Minderjähriger, Opfer/Zivilist. Each word from the excerpted material is semantically and etymologically explained, followed by a morphological-syntactic and stylistic analysis and comparison, with the aim of discovering whether these words were used in an adequate or inadequate linguistic manner.

"töten"/"sterben"/"Massaker, massakrieren"

The verb **töten** appears as early as in Old High German, as well as in Middle High German with the meaning "totmachen" (in English: to kill/ to put to death), and Duden (2006, p. 1691) explains this meaning in the following way: a) den Tod von jmdm. etw. herbeiführen, verursachen, verschulden (in English: to cause someone's death).

NJHUR (2005, p. 1708) gives the following translation of the verb **"töten"**: to kill, murder, put to death. Anić (2004, p. 1642) explains the meaning of the same verb in the following manner: to forcibly take someone's life, to deprive of life, to kill, to murder. RIZJ (2007, p. 1158) interprets the verb in a similar way as Anić: to forcibly take someone's life, to deprive of life, to kill, to murder.

The verb **sterben** (Duden, 2006, p. 1611) appears in Old High German as well as in Middle High German with the meaning "erstarren, steif werden" (in English: to harden, to shorten, to solidify, to petrify), while today its meanings can be classified into four categories:

a) aufhören zu leben, sein Leben beschließen (in English: stop living, end a life);

b) mit Akkusativ: einen bestimmten Tod erleiden (Heldentod, Hungertod) (in English in the accusative case: die);

c) für etwas sein Leben lassen: für seinen Glauben, für das Vaterland (in English: die for faith, for the fatherland);

d) durch den Tag genommen, z.B. Ihr ist der Mann gestorben (in English: to take someone away by death, e. g. Her husband died).

NJHUR (2005, p. 1626) translates the verb **sterben** as: dying, to die, while Anić (2004, p. 1668) translates the same verb in the following way: to come to a state without vital functions, stop living. RIZJ (2007, p. 1175) states that the verb **to die** semanticizes as: pass away, cease to be (...).

If we look at the similarities in the meaning of the verbs "töten" and "sterben", it can be noticed that both verbs describe the end of life, but the verb "töten" refers to the violent taking of life, while the verb "sterben" refers to the cessation of life, without implying a violent deprivation of it.

Adequate verb is used for reporting in the examples that follow, considering these examples are about the violent taking of life rockets, killing by soldiers, the verb "töten":

Example 1: Da ist Zion, ein Mann um die 60, dessen Sohn von den Terroristen **getötet wurde**.[2]

Example 2: (...)Und am 7. Oktober sind sie in unsere Siedlungen eingedrungen und haben nur Zivilisten abgeschlachtet und **getötet.**[3]

Example 3: Ephraim überlebt Massaker„Sie **töteten**, um zu erniedrigen"(...)[4]

Example 4: Bei Musik-Festival-Massaker-Ex-Fußball-Profi von Hamas **getötet**.[5]

Example 5: Dass auch diese „selbst gebastelten Raketen" Menschen töten sollen und dies auch tun (dank „Iron Dome" in den vergangenen-Jahren nur selten), wird dabei ausgeblendet.[6]

If we look at the following examples, we will notice that the verb "töten" is used with regards to the bombing or the violent suffering of children, which is correct, but the structures in which the said verb is positioned call its use into question:

Thus, for example, in the following example, with the interrogative sentence and the adjective "tatsächlich" (in English: really, in fact), a doubt is projected about the content, that is, about the adequate use of the verb „to kill/put to death", even though its use in this case is completely legitimate: Example 6: *Doch **töten** die israelischen Luftangriffe tatsächlich jede Stunde zahlreiche Kinder, wie die Vereinten Nationen (UN) behaupten? Worauf stützen sich die Angaben der UN?*[7]

In the second example, next to the verb "**töten"**, which describes the violent suffering of children, the adjective "angeblich" is inserted, which is translated (NJHUR, 2005, p. 63) as „allegedly, supposedly" or as something that cannot be confirmed as true according to Duden (2006, p. 141), for example: Example 7: Hauptquelle der Statistiken **zu angeblich getöteten** Kindern im Gazastreifen ist das „Palästinensische Gesundheitsministerium" mit Sitz in Gaza.[8] The next example demonstrates a similar interpretation by combining the verb "töten" and the adjective "angeblich" with the meaning „allegedly": Example 8: *Ein Mädchen musste mit einem mit roter Farbe bespritztem Laken posieren, dass offenbar* für *angeblich von Israel getötete Kinder stehen soll.*[9]

The following examples describe the violent killing of children/civilians by bombing, but

2 https://www.bild.de/news/ausland/news-ausland/bild-report-aus-israels-millionen-metropole-tel-aviv-die-auferstehung-einer-stad-85901992.bild.html (Accessed 21st December 2023), article published on 29. 10. 2023. Example 1: Translation: This is Zion, a sixty-year-old man whose son was killed by the terrorists.

3 https://www.bild.de/politik/ausland/politik-ausland/israels-ex-geheimdienstchef-so-lange-dauert-der-krieg-gegen-die-hamas-noch-86018968.bild.html (Accessed 20th December 2023), article published on 08. 11. 2023. Example 2: Translation: And on the 7th of October they broke into our neighborhoods and just slaughtered and killed the civilians.

4 https://www.bild.de/video/clip/bild-tv/ephraim-ueberlebt-massaker-sie-toeteten-um-zu-erniedrigen-85702914.bild.html (Accessed 21st December 2023.), article published on 11. 10. 2023. Example 3: Translation: Ephraim has survived the massacre. They killed to humiliate.

5 https://www.bild.de/sport/fussball/fussball-international/bei-musik-festival-massaker-ex-fussball-profi-von-hamas-getoetet-85692722.bild.html (Accessed 20th December 2023), article published on 10. 10. 2023. Example 4: Translation: Hamas killed a former professional football player at the music festival massacre.

6 https://www.bild.de/politik/ausland/politik-ausland/von-apartheid-bis-spirale-der-gewalt-das-woerterbuch-der-hamas-versteher-85731156.bild.html (Accessed 23rd December 2023), article published on 13. 10. 2023. Example 5: Translation: That these "handmade rockets" should kill people and do so (thanks to the "Iron Dome" in previous years only rarely) is covered up in that case.

7 https://www.bild.de/politik/ausland/politik-ausland/zivile-opfer-in-gaza-verbreitet-die-un-ungeprueft-hamas-propaganda-85767658.bild.html (Accessed 24th December 2023), article published on 17. 10. 2023. Example 6: Translation: But, are the Israeli bombings really killing children every hour, as claimed by the United Nations? What are the UN allegations based on?

8 https://www.bild.de/politik/ausland/politik-ausland/zivile-opfer-in-gaza-verbreitet-die-un-ungeprueft-hamas-propaganda-85767658.bild.html (Accessed 24th December 2023), article published on 17. 10. 2023. Example 7: Translation: The main source of statistics for children allegedly killed in Gaza is the "Palestinian Ministry of Health" based in Gaza.

9 https://www.bild.de/regional/berlin/berlin-aktuell/berlin-so-nutzen-juden-hasser-kinder-fuer-eine-demo-aus-85903908.bild.html (Accessed 21st December 2023), article published on 29. 10. 2023. Example 8: Translation: One girl had to pose with a bed sheet splattered with red paint, apparently to represent the children allegedly killed by Israel.

the verb „sterben" (in English: to die) is used, which does not adequately describe the said suffering, because „sterben", as explained earlier, is used for dying in general: Example 9: *Dass Kinder bei den israelischen Luftangriffen auf den Gazastreifen sterben, ist unstrittig.*[10] or Example 10: *Aber woher wissen wir* überhaupt*, was in Gaza – einer von radikalsten Islamisten regierten Diktatur – vor sich geht, wie viele Menschen dort sterben?*[11]

The following example is very interesting. Without contextualizing and questioning the content of the claims from this example, we notice that in the first part the verb **„sterben"** is used for the suffering of children, which does not imply the violent taking of life, as is the case with the verb "**töten"**. Further, the adequate verb „ermorden" is used to refer to the suffering of other civilians, which is semantically equaivalent to the verb "**töten"** and has the same meaning „to kill/put to death" violently.

Example 11: *Rachdan behauptet, dass in Gaza pro Tag mehr Kinder sterben würden als früher in Auschwitz. Besonders widerwärtig: Rachdan rechnet die Zahl der in Auschwitz ermordeten Kinder runter (von mehr als 230 000 auf 200 000).*[12]

In addition, the verb „sterben" itself is questioned, because the combination "würde + infinitive" is used, which in German is an alternative to the German Subjunctive II (Konjuktiv II)[13] used to describe unrealistic actions and situations. The questionability of interpretations of the taking of life by violent means, such as rocket fire or bombing, with the verb „sterben" gains additional importance if we analyze examples which interpret the killing of children in Ukraine in a linguistically correct manner.

Example 12: *Diesmal töteten Putins Raketen auch Kinder; Unter den Todesopfern des Angriffs auf den Stadtteil Denjansky sei ein Kind, erklärte die Militärverwaltung von Kiew am Donnerstag im Onlinedienst Telegram. Zehn Menschen wurden demnach in Denjansky verletzt, zwei weitere im Stadtteil Dniprowksy. Zunächst hatten offizielle Berichte zwei getötete Kinder vermeldet.*[14]

Also:

Example 13: *109 leere Kinderwagen* für 109 *getötete Kinder; Trauern um 109 getötete Kinder – eine Ukrainerin drückt ihre Kinder fest an sich.* [15]

Duden (2006, p. 1119) explains the verb **massakrieren** as follows: in grausamer, brutaler Weise umbringen, quälen (in English: to kill someone in a cruel or brutal way), while the noun Massaker is semantiziced as: das Hinmorden einer großen Anzahl unschuldiger, wehrloser Menschen, Blutbad (in English: killing a large number of innocent people, people who cannot defend themselves, bloodshed). NJUHR (2005, p. 1101) translates the same verb as: to massacre, to slaughter, to kill brutally, while Anić (2004, p. 731) explains what massacre means – to carry out a massacre, and what massacre means – the cruel killing of a large number of people, slaughter, bloodshed. In RIZJ (2007, p. 365), we find only the noun „massacre" with the explanation that it means: slaughter, bloodshed, mass killing, butchery.

The next few examples testify to the correct use of the verb massakrieren, that is, the noun Massaker.

10 https://www.bild.de/politik/ausland/politik-ausland/zivile-opfer-in-gaza-verbreitet-die-un-ungeprueft-hamas-propaganda-85767658.bild.html (Accessed 22nd December 2023), article published on 17. 10. 2023. Example 9: Translation: It is not debatable that children are dying during Israeli bombings of Gaza.

11 https://www.bild.de/politik/ausland/politik-ausland/das-sterben-der-anderen-warum-man-mitgefuehl-mit-gaza-haben-muss-85907662.bild.html (Accessed 23rd December 2023), article published on 31. 10. 2023. Example 10: Translation: But how do we even now what is happening in Gaza, one of the dictatorships run by the most radical Islamists, how many people are dying there?

12 https://www.bild.de/politik/inland/politik-inland/sie-verharmlost-sogar-den-holocaust-greta-thunbergs-radikalste-terror-freundin-86077500.bild.html (Accessed 24th December 2023), article published on 13. 11. 2023.Example 11: Translation: Rachdan claims that more children die in Gaza every day than in Auschwitz. The following is particularly disgusting: Rachdan reduces the number of children killed in Auschwitz (from more than 230, 000 to 200,000).

13 https://www.duden.de/sprachwissen/sprachratgeber/konjunktiv-1-oder-2#:~:text=Der%20Konjunktiv%20II%20kann%20folgenderma%C3%9Fen,des%20nur%20Gedachten%20prinzipiell%20m%C3%B6glich. (Accessed 24th December 2023)

14 https://www.bild.de/politik/inland/politik-inland/ukraine-krieg-kiew-in-putins-raketenhagel-diesmal-toeteten-die-raketen-auch-kind-84140498.bild.html (Accessed 24th December 2023), article published on 1.6. 2023. Example 12: Translation: Putin's missiles have now killed children; a child is among the dead victims of the attack on the city district Denyansky, as reported by Kiev's military administration on Thursday via the Telegram online service. According to them, ten people were injured in in Denyansky, two more in Dniprowsky district. Initially, the official report said two children were killed.

15 https://www.bild.de/politik/ausland/politik-ausland/ukraine-krieg-lemberg-109-leere-kinderwagen-fuer-109-getoetete-kinder-79499790.bild.html (Accessed 23rd December 2023), article published on 18. 03. 2022. Example 13: Translation: 109 strollers for 109 murdered children; 100 murdered children are being mourned- A Ukrainian woman hugs her children tightly.

Example 14: *Levy zeigt ein Video des Massakers*: *Die Terroristen brüllen „Allahu Akbar", feuern mit Sturmgewehren, zerren halb tote Festivalgäste auf Pickup-Trucks. Ein Akt unfassbarer Barbarei!*[16] ; Example 15: *Israelin Millet (27)* überlebte *das Festival-Massaker. Millet Ben Haim (27)* überlebte *das Massaker der Hamas-Terroristen bei einem Musikfestival nahe dem Gazastreifen. Sechs Stunden versteckte sie sich in einem Gebüsch. Sie wurde gerettet, aber heute fühlt sie sich „wie ein Geist" Sie* überlebte *eines der tödlichsten Massaker an Juden seit dem Ende des Holocaust*[17]. ; Example 16: *Nach dem Massaker in Israel am 7. Oktober wurden die Hamas-Terroristen in Gaza für ihre Taten gefeiert.*[18]; Example 17: *Die irrsten Lügen* über *das Hamas-Massaker. Mahmoud (50) schaltet sich ein. Man könne den Feind ja „nicht mit Blumen bekämpfen", relativiert er das Massaker (…)*[19] ; Example 18: *Hagar* überlebte *Hamas-Massaker*[20]; Example 19: *Nach dem Hamas-Massaker. Berliner SPD-Chef schwieg neun Tage zum Judenhass*[21] ; Example 20: *Das israelische Militär hat bei Bombenangriffen auf die Hamas im Gazastreifen nach eigenen Angaben einen der mutmaßlich Verantwortlichen des Massakers an israelischen Zivilisten getötet.*[22]; Example 21: *Soldat berichtet von Kibbuz-Massaker„Ich sah abgeschlachtete Familien"*[23]; Example 22: *Reporterin berichtet* über *Massaker„Babys mit abgeschnittenen Köpfen"*[24]; Example 23: *Sie entkam dem Tod an diesem Morgen mehrere Male! Wie durch ein Wunder trotzte sie dem Schicksal und* überlebte *das Massaker, das Hamas-Terroristen am Samstagmorgen auf einem Festival in Israel anrichteten.*[25]; Example 24: *Mit ihrer klugen Entscheidung verhinderte sie ein Massaker25-Jährige rettet ihren Kibbuz vor Terroristen. Mit einer mutigen Entscheidung hat eine junge Frau ein Massaker verhindert(…)*[26]; Example 25: *Bei Musik-Festival-Massaker Ex-Fußball-*

16 https://www.bild.de/news/ausland/news-ausland/mama-getoetet-papa-entfuehrt-diesem-jungen-raubte-die-hamas-die-eltern-86412740.bild.html (Accessed 21st December 2023), article published on 22. 12. 2023. Example 14: Translation: Levy shows a video of the massacre: terrorists shouting "Allahu Akbar", firing assault rifles, dragging half-dead festival guests into trucks. An act of unthinkable barbarism!

17 https://www.bild.de/politik/ausland/politik-ausland/israelin-millet-27-ueber-festival-massaker-ich-wusste-sie-wuerden-mich-vergewalt-86145388.bild.html (Accessed 23rd December 2023), article published on 19. 11. 2023. Example 15: Translation: Millet (27), an Israeli woman, survived the massacre at the festival. Millet Ben Haim (27) survived the massacre by Hamas's terrorists at a music festival near Gaza. For six hours, she hid In the bushes. She was saved, but today she feels "like a ghost". She survived one of the deadliest massacres of Jews since the end of the Holocaust.

18 https://www.bild.de/politik/ausland/politik-ausland/neue-umfrage-grossteil-der-palaestinenser-unterstuetzt-hamas-massaker-86126474.bild.html (Accessed 22nd December 2023), article published on 17. 11. 2023. Example 16: Translation: After the massacre committed in Israel on October 7, Hamas terrorists were celebrated in Gaza for their deeds.

19 https://www.bild.de/news/ausland/news-ausland/propaganda-in-ost-jerusalem-die-juden-muessen-dieses-land-verlassen-85974566.bild.html (Accessed 21st December 2023), article published on 14. 11. 2023. Example 17: Translation: The craziest lies about the Hamas massacre. Mahmoud (50) gets involved in the discussion: You can't "fight with flowers" against the enemy, he further relativizes the massacre: (…).

20 https://www.bild.de/video/clip/news/hagar-ueberlebte-hamas-massaker-dann-helft-ihr-den-moerdern-85811086.bild.html (Accessed 22nd December 2023), article published on 20. 10. 2023. Example 18: Translation: Hagar survived the Hamas massacre.

21 https://www.bild.de/regional/berlin/berlin-aktuell/nach-hamas-massaker-berliner-spd-chef-schwieg-neun-tage-zum-judenhass-85754808.bild.html (Accessed 20th December 2023), article published on 16. 10. 2023. Example 19: Translation: after the Hamas massacre, the Head of the Berlin SPD went silent for nine days.

22 https://www.bild.de/politik/2023/politik/massaker-in-israel-israel-toetet-hamas-verantwortlichen-85742448.bild.html (Accessed 21st December 2023), article published on 14. 10. 2023. Example 20: Translation: During the bombing of Hamas in Gaza, the Israeli army reported that it killed one of the potential perpetrators of the massacre of Israeli civilians.

23 https://www.bild.de/video/clip/politik/soldat-berichtet-von-kibbuz-massaker-ich-sah-abgeschlachtete-familien-85715492.bild.html (Accessed 25th December 2023), article published on 12. 10. 2023. Example 21: Translation: A soldier reports on the massacre in the Kibbutz: "I saw slaughtered families".

24 https://www.bild.de/politik/ausland/politik-ausland/israel-reporterin-ueber-massaker-babies-mit-abgeschnittenen-koepfen-85702662.bild.html (accessed 19th December 2023), article published on 11. 10. 2023. Example 22: Translation: The reporter reports on the massacre: "Babies with severed heads".

25 https://www.bild.de/politik/ausland/politik-ausland/israel-hamas-massaker-bei-festival-sie-vergewaltigten-frauen-neben-leichen-85699924.bild.html (Accessed 19th December 2023), article published on 11. 10. 2023. Example 23: Translation: She escaped death that morning more than once! Miraculously, she defied fate and survived the massacre by Hamas terrorists on Saturday morning at a festival in Israel.

26 https://www.bild.de/politik/ausland/politik-ausland/israel-25-jaehrige-verhindert-massaker-in-ihrem-kibbuz-85704694.bild.html (Accessed 19th December 2023.), article published on 11. 10. 2023. Example 24: Translation: Her wise decision prevented a massacre. A 25-year-old woman saved her kibbutz from terrorists. A young woman made a brave decision to prevent a massacre.

Profi von Hamas getötet[27] *;* Example 26: *Kommentar zum Massaker in Kfar Azza..*[28] *;* Example 27: *Bunker-Massaker in Israel*[29]*;* Example 28: *Terror-Massaker bei Musik-Festival in Israel. Das größte Massaker des Terror*-Überfalls *auf Israel beginnt kurz vor Sonnenaufgang, gegen 6.30 Uhr, am Samstagmorgen.*[30]

It is interesting that the verb "massakrieren" is not found in the excerpted examples. Instead, the use of noun "Massaker" is preferred, very often as an integral part of compounds in which the noun "massacre" is the basic or second part of the noun compound, while the first constituent is a noun that determines or describe in more detail what kind of massacre it is, a determinant (e. g. *Festival-Massaker, Hamas-Massaker, Musik-Festival-Massaker, Kibbuz-Massaker*).

While we were analyzing the reports of Bild.de website, we did not find any example in which the mass killing of Palestinian civilians is referred to by the verb **massakrieren** or the noun **Massaker.**

Even in the case of killing at least 500 Palestinian civilians in a single missile strike, which by all semantic criteria requires the use of the verb **massacre** or the noun **Massaker**, the following two linguistic structures are used:

Example 29: *Am Dienstagabend meldete die Terror-Gruppe Hamas durch ihre sogenannte Gesundheitsbehörde, Israel habe durch einen Luftangriff auf ein Krankenhaus mindestens 500 Menschen getötet.*[31]

Example 30: *Doch, was als* ***„das schlimmste Massaker der israelischen Armee"*** *dargestellt wurde, stellte sich im Laufe der Nacht mit sehr hoher Wahrscheinlichkeit als palästinensischer Terror gegen palästinensische Zivilisten heraus.*[32]

The first example uses the verb "töten" in Subjunctive I (Konjuktiv I) mood which is used to report someone's words, and by which the one who reports wants to distance himself/herself from the speaker. [33]

However, in the second example, the term **Massaker** in the excerpted sentence is put under quotation marks, which are used for direct speech, emphasis, and particularly for ironizing the content.[34]

From the example above, it is evident that the terms referring to violent or brutal taking of life, including adequate moods (German: Indikativ), are used in describing the suffering of Israeli civilians. It is also evident that the suffering of Palestinian civilians, in the examples provided, is interpreted either through the verbs of non-violent dying „**sterben**" or, if linguistically adequate terms are used, or through the use of terms that question this suffering in a certain way ("tatsächlich?" "angeblich"), such as quotation marks or linguistically unreal mood (Subjunctive II/Konkjuktiv II).

"Kinder"/"Minderjährige"

The noun **Kind** (Duden, 2006: 950) has been recorded in German since the time of Old High German with the meaning "conceived, born". In Dud-

27 https://www.bild.de/sport/fussball/fussball-international/bei-musik-festival-massaker-ex-fussball-profi-von-hamas-getoetet-85692722.bild.html (Accessed 20th December 2023.), article published on 10. 10. 2023. Example 25: Translation: A former professional football player killed at the music festival massacre.

28 https://www.bild.de/politik/kolumnen/politik-ausland/kommentar-zum-massaker-in-kfar-azza-eine-neue-dimension-des-grauens-85704150.bild.html (Accessed 19th December 2023), article published on 10. 10. 2023. Example 26: Translation: Commentary about Kfar Azza massacre.

29 https://www.bild.de/politik/ausland/politik-ausland/bunker-massaker-in-israel-terroristen-warfen-handgranaten-in-den-schutzraum-85693952.bild.html (Accessed 19th December 2023.), article published on 10. 10. 2023. Example 27: Translation: Massacre in a bunker in Israel.

30 https://www.bild.de/politik/ausland/politik-ausland/israel-hamas-massaker-bei-festival-sie-vergewaltigten-frauen-neben-leichen-85683378.bild.html (Accessed 19th December 2023.), article published on 09. 10. 2023. Example 28: Translation: Massacre with terrorist aspirations at a music festival in Israel. The greatest carnage as a result of the terrorist attack on Israel begins shortly before sunrise, around 6:30 a.m., on Saturday morning.

31 https://www.bild.de/politik/ausland/politik-inland/krankenhaus-tote-in-gaza-so-fiel-die-welt-auf-die-hamas-luegerein-85788064.bild.html (Accessed 27th December 2023), article published on 19. 10. 2023. Example 29: Translation: On Tuesday night, the terrorist group Hamas announced through their so-called health authority that Israel had allegedly killed at least 500 people in airstrikes on the hospital.

32 https://www.bild.de/politik/ausland/politik-ausland/krankenhaus-explosion-islamisten-rakete-explodierte-in-gaza-beweise-85785732.bild.html (Accessed 27th December 2023), article published on 18. 10. 2023. Example 30: Translation: But it turned out overnight that what was portrayed as "the worst massacre by the Israeli army" was mostly like Palestinian terrorism against Palestinian civilians.

33 https://www.studysmarter.de/schule/deutsch/grammatik/konjunktiv-1/ (Accessed 27th December 2023)

34 https://www.duden.de/sprachwissen/rechtschreibregeln/anfuehrungszeichen (Accessed 21st December 2023)

en we find two meanings:

1. a) noch nicht geborenes, gerade oder vor noch nicht langer Zeit zur Welt gekommenes menschliches Lebewesen; Neugeborenes, Baby, Kleinkind (English: unborn, just or a short time ago born human being, who has just come into the world; newborn, baby, infant);

   b) Mensch, der sich noch nicht im Lebensabschnitt der Kindheit befindet (etwa bis zum Eintritt der Geschlechtsreife), noch kein Jugendlicher ist, noch nicht erwachsener Mensch (English: man, who is not yet in the life stage of childhood, approximately until the beginning of puberty/sexual maturity, and is neither an adolescent nor an adult);

2. von jmdm.leiblich abstammende Person, unmittelbarer Nachkomme (English: a person biologically descended from another person, immediate descendant).

In NJHUR (2005, p. 924), the noun Kind translates as "child", while Anić (2004, p. 215) offers the following meaning of the word "child": child- 1. a person from birth to puberty; 2. son and daughter to parents regardless of age and age.

On the other hand, Duden (2006, p. 1146) offers the following semanticization for the word Minderjährige (nominalized adjective)/minderjährig (adjective): (von Jugendlichen) noch nicht volljährig, nicht mündig (English: of an adolescent/teenager, a person who is not of legal age). Duden for the noun "Jugendliche" (2006, p. 910) offers the meanings: a) junger Mensch, jmd., der sich im Lebensabschnitt zwischen Kindheit und Erwachsenen befindet (English: a young person, who is in the life phase between childhood and the mature/adult age); b) jur. 14.18. Lebensjahr (legal. period from 14 to 18 years of age). NJHUR translates "minderjährig" as: juvenile, underage, while in Anić (2004, p. 731) the word "juvenile" is semanticized as follows: the one who is not of legal age to be legally liable (18-21 years). RIZJ (2078, p. 362) offers the following meanings for "minor": the one who has insufficient age for maturity, underage, immature, antonym: of age.

Below we will list a significant number of examples of reporting on the plight of children in which the term **children** is used in correct linguistic and semantically aligned structures:

Example 31: Über *die Geiseln sagt die Politikberaterin*: *„Wir sprechen von* über *200 Frauen,* ***Kindern, Babys****,* Älteren*, Holocaust*-Überlebenden. ***Kleine Kinder****, deren Eltern vor ihren Augen massakriert wurden und die völlig hilflos sind. Das muss sofort enden!"*[35] or Example 32: *Radikale gibt es in jedem Land der Welt. ABER*: *Frauen, Männer,* ***Kinder, Babys*** *und Greise hinrichten, lebendig verbrennen, enthaupten – das macht nur eine Seite. Die palästinensische Hamas.*[36]*.*

Example 33: *"Diese Ideologien stellen Israel als Kolonialmacht und Juden als weiße Unterdrücker dar. Hamas-Terroristen,* ***die sogar israelische Kinder abschlachten****, gelten nach dieser Lesart als Widerstandskämpfer.(..)*[37]

Example 34: *Bei neun der freigelassenen Geiseln handelt es sich nach israelischen Angaben um* ***Kinder****. Unter ihnen*: *die kleine Abigail (4), deren Eltern von palästinensischen Terroristen am 7. Oktober brutal ermordet worden sind.*[38]

Selected examples of linguistically and semantically correct use of the noun "Kind(er)" are

35 https://www.bild.de/politik/talk-kritik/talk-kritk/entsetzen-bei-maybrit-illner-muetter-hoffen-dass-ihre-geisel-toechter-tot-sind-85807706.bild.html (Accessed 19th December 2023), article published on 12.11.2023.Example 31: Translation: A political advisor says about the hostages: "We are talking about over 200 women, children, babies, elderly people, Holocaust survivors, young children, whose parents were massacred in front of their eyes, children who are completely helpless. This must end now!".

36 https://www.bild.de/politik/inland/politik-inland/sprecherin-von-fridays-for-future-klima-aktivistin-schockt-mit-vorwurf-gegen-jud-85762668.bild.html (Accessed 19th December 2023), article published on 16.10.2023. Example 32: Translation: There are radicals in every country in the world. BUT: to execute, to burn alive, to behead women, men, children, babies, the elderly - only one side does that. Palestinian Hamas.

37 https://www.bild.de/politik/inland/politik-inland/hass-gegen-juden-und-israel-in-deutschen-hoersaelen-werden-unsere-unis-zum-recht-86444728.bild.html (Accessed 20th December 2023), Article published on 16.12.2023. Example 33: Translation: These ideologies present Israel as a colonial power and the Jews as white, oppressive people. Hamas terrorists, who even behead Israeli children, are considered resistance fighters.

38 https://www.bild.de/politik/ausland/politik-ausland/geisel-deal-von-israel-und-hamas-eine-seite-umarmt-ihre-kinder-die-andere-den-te-86225224.bild.html (Accessed 18th December 2023), article published on 26.11.2023). Example 34: Translation: Nine of the hostages released are, according to Israeli data, children. Among them is little Abigail, 4, whose parents were brutally killed by Palestinian terrorists on October 7.

followed by examples containing inadequate use of words, punctuation or verb forms.

Example 35: *Dass es palästinensische Hamas-Terroristen waren, die am 7. Oktober* ***gezielt israelische Kinder abschlachteten, Säuglinge ermordeten*** *und verschleppten, verschweigt Rachdan. Sie behauptet, dass in Gaza pro Tag mehr* ***Kinder sterben würden*** *als früher in Auschwitz.*[39]

In the first such example, we detect the mention of the plight of children in two moods. In the first part, the suffering or dying of children is stated in an indicative[40], verbal form describing the facts and everything that corresponds to reality, while in the second part of the sentence, when describing the plight of children, a mood is used that does not reflect "reality", but a "würde + infinitive" form, which is an alternative to the German mode of subjunctive II or a mood that describes the irrealis (cf. Duden, 2006, p. 38).

The following comparison refers to the protests against the suffering and plight of children in the war. The first example linguistically correctly describes the tribute paid to the afflicted children with "bloody toys":

Example 36: *Die blutigen Teddys am Dizengoff-Brunnen stehen* für ***israelische Kinder****, die in der Gewalt der Hamas sind.*[41]

In the second example, when reporting on a rally honoring the murdered children, the word "angeblich" is added, which translates as "allegedly" (cf. Duden, 2006, p. 141), and therefore the complete context and its credibility are questioned:

Example 37: *Ein Mädchen musste mit einem mit roter Farbe bespritztem Laken posieren, dass offenbar* für ***angeblich von Israel getötete Kinder*** *stehen soll.*[42].

For the elaboration and linguistic analysis of the following examples, in which the term "child" is used, it is necessary to focus on the stylistic figure of exaggeration, hyperbole. Hyperbole according to Begić (2012, p. 140) is mentioned by Socrates (4th century BC), Cicero calls it *supralatio* ,Quintilian *superiectio*, and the English sixteenth-century thinker G. Puttenheim presented hyperbole via metaphors *known liar* and *exaggerator*. Examples of hyperboles are: *"I've told you a million times not to do it!"; "I died laughing!".*[43]

According to available scientific studies, a three-year-old child is not able to define the emotion of hatred or understand the complex challenge such as, for example, "dying as a martyr for ideals." However, in the following example, this is argued to be possible through the "indicative" (reality) mood:

Example 38: *Dort lernen bereits Dreijährige, dass Juden zu hassen sind und es erstrebenswert sei, als Märtyrer zu sterben.*[44]

We can conclude that from the linguistic point of view, such a description of children from the age of three can be seen as an exaggeration, that is, as the use of hyperbole.

The following example of reporting on the plight of children in war using an adversative[45] or opposite sentence contrasts the role and plight of innocent children, sets them aside and assigns them a role on the "opposing" sides, which is either

39 https://www.bild.de/politik/inland/politik-inland/gruenen-chefin-ricarda-lang-rechnet-ab-greta-absolut-unanstaedig-86083522.bild.html (Accessed 25th December 2023), article published on 12.11.2023. Example 35: Translation: That these were Palestinian Hamas terrorists, who on October 7 intentionally slaughtered Israeli children, killed infants and kidnapped them, Rachdan does not say. She claims that more children die in Gaza daily than in Auschwitz earlier.

40 The indicative is a German mood and is used to describe "normal" situations or events. Indicative describes the content that corresponds to the factual situation and does not question it, e.g. Ein Tag hat 24 Stunden (Eng. A day has 24 hours.). https://www.duden.de/sprachwissen/sprachratgeber/Die-drei-Modi-der-deutschen-Sprache#:~:text=Der%20Indikativ%20wird%20meistens%20als,die%20meisten%20G%C3%A4ste%20schon%20gegangen. (downloaded 24th December 2023)

41 https://www.bild.de/news/ausland/news-ausland/bild-report-aus-israels-millionen-metropole-tel-aviv-die-auferstehung-einer-stad-85901992.bild.html (Accessed 29th December 2023), article published 29.10.2023). Example 36: Translation: Bloody teddy bears at Dizbosoff-Brunnen symbolize Israeli children, held by Hamas.

42 https://www.bild.de/regional/berlin/berlin-aktuell/berlin-so-nutzen-juden-hasser-kinder-fuer-eine-demo-aus-85903908.bild.html (Accessed 20.12.2023), article published on 29.10.2023. Example 37: Translation: The protesters even instrumentalized one child for the purpose of sending hate messages! One girl had to pose with a sheet that was sprayed with red paint, which was supposed to symbolize the allegedly murdered children by Israel.

43 https://www.lektire.hr/hiperbola/ (Accessed 24th December 2023).

44 https://www.bild.de/politik/ausland/politik-ausland/das-sterben-der-anderen-warum-man-mitgefuehl-mit-gaza-haben-muss-85907662.bild.html (Accessed 23.12.2023), Article 31.10.2023. Example 38: Translation: There, children already at three years of age learn that Jews must be hated and that it is desirable to die as a martyr.

45 https://learnattack.de/schuelerlexikon/deutsch/adversativsatz (Accessed 27.12.2023).

black or white, which can be considered an inadequate syntactic structure in this case. It is the case of the following example:

Example 39: *Während Israels Armee* ***Kinder schützt, nutzen die Terroristen der Hamas Kinder, um sich selbst zu schützen***[46]

Therefore, in this example, children are under protection ("schützt"), which is the only correct form and role of children in suffering (that they should be protected). However, the example below states that children are used to protect terrorists. The verb "schützen" meaning "to protect, to protect" (NJHUR, 2005, p. 1521) in Duden (2006, p. 1504) is explained as follows: 1. jmdm., einer Sache Schutz gewähren, einen Schutz vreschaffen (English: to protect someone/something), and the following context is also stated in the example: sich schützend vor ein Kind stellen (English: to stand protectively in front of the child). The verb "nutzen" in all examples means "to use someone" to achieve a goal, some advantage, success (cf. Duden, 2006, p. 1222), which is a verb that applies to children in the second part of the sentence, who are "exploited" to protect (read: were a human shield) terrorists. If we also look at the semantics of verbs used within an inadequate syntactic adversarial structure, then in this case it is also an example of a stylistic figure of exaggeration, hyperbole, because a child cannot have the "power" to be a shield.

The following example is also abundant in inadequate linguistic and semantic content:

Example 40: *Unter den freigelassenen palästinensischen Häftlingen befinden sich auch* ***Minderjährige****. Viele arabische, aber auch einige westliche Medien* ***bezeichneten sie als „Kinder".***[47]

If we compare the meaning of the noun "Kind" and "Minderjährige", then we can conclude that the difference is that Minderjährige are still underage children, they are not yet adults. This example contains both nouns, where it is stated that among the freed there are also teenagers ("Minderjährige"), and not children, as stated in numerous media. The teenager is also a slightly older child, but avoiding the noun "Kinder" in the indicative suggests the use of a stylistic figure of the litote[48], which is the opposite of hyperbole, and is used to weaken the first/right expression, to soften and diminish certain impressions and representations. In this case, there is an example of an inadequate use of the word "Minderjährige", instead of the word "Kinder" as an understatement.

In the continuation of this example, the word "Kinder" (children) is mentioned in the quotation marks, which represents a continuation of the inadequate linguistic form. Here, attention should be paid to the use of quotation marks, which are used in German according to Duden grammar in the case of direct speech (e.g. Sie sagte: "Hier gefällt es mir."; English: She said: "I like it here."), when emphasizing parts of words, words, or parts of text, when quoting, but they are also used to emphasize something in an ironic way, e.g. Dieser "treue Freund" verriet ihn als Erster. (English: That "loyal friend" was the first to betray him.).[49] Whatever function of these quotation marks may have been used, the linguistic malfunction of that part of the assertion cannot be disputed. We have a similar situation in the following example:

Example 41: *„Die Regierung hat die Grundzüge der ersten Phase eines Abkommens gebilligt, das die Freilassung von mindestens 50 Entführten* ***– Frauen und Kinder*** *– an vier Tagen vorsieht, an denen die Kämpfe ruhen werden", hieß in der offiziellen Erklärung, die das Büro des Ministerpräsidenten* übermittelte*.*

Israelischen Medien zufolge soll es sich ***um 30 Kinder, acht Mütter sowie zwölf*** ältere ***Frauen*** *handeln.*

Im Gegenzug wird Israel etwa ***150 palästinensische Frauen und Minderjährige*** *freilassen(…).*[50]

46 https://www.bild.de/politik/ausland/politik-ausland/hamas-kalkuel-terroristen-wuenschen-sich-tote-gaza-bewohner-85753496.bild.html (Accessed 23.12.2023), Article 16.10.2023). Example 39: Translation: While Israeli army protects children, Hamas terrorists use children to protect themselves.

47 https://www.bild.de/politik/ausland/politik-ausland/geisel-deal-von-israel-und-hamas-eine-seite-umarmt-ihre-kinder-die-andere-den-te-86225224.bild.html (Accessed 23.12.2023), Article 26.11.2023). Example 40: Translation: Juveniles are among the freed Palestinian prisoners. Many Arab, as well as some Western media sources, describe them as "children".

48 https://www.lektire.hr/litota/ (Accessed 27.12.2023)

49 https://www.duden.de/sprachwissen/rechtschreibregeln/anfuehrungszeichen (downloaded on 21. 12. 2023).

50 https://www.bild.de/politik/ausland/politik-ausland/hamas-krieg-israels-regierung-stimmt-geisel-deal-zu-86175364.bild.html (Accessed 20th December 2023), member since 22.11.2023. Example 41: Translation: "The government approved the drafts of the first phase of the agreement, which envisions the release of at least 50 kidnapped women and children over four days, when the fighting will stop," was the official statement issued by the president's office. According to Israeli media, these are 30

For the period of reporting on the plight of children in the Gaza Strip, we did not come across any "indicative" mood, that is, a mood that describes reality, in which the noun "Kind" or "Kinder" is used in the context of the suffering of Palestinian children. These terms are predominantly used in quotation marks (either to remotely convey a source or to challenge the authenticity of a source or event), using subjunctive II (with the aim of contextualizing the plight of Palestinian children in a form that does not fully reflect reality or that could only potentially be accurate) or with the addition of "angeblich" (allegedly, ostensibly).

"Opfer/Zivilisten"

Civilians in Duden (2006, p. 1983) are described under the noun "Zivilist" as "citizens who are not members of the army", while the noun Opfer in Duden (2006, p. 1237) is semanticized as: jmd.der durch jmdn./etw.umkommt (English: someone who loses his life for someone/something), in NJHUR (2005, p. 1228) Opfer is translated as "victim", and it is explained in RIZJ (2007, p. 1312) as "sufferer, unhappy one, one who suffers violence, killed, one who succumbed to violence committed against him". Thus, it can be concluded that the killed civilians in the war should be described by the term "Opfer" (in English victim). For violently killed Israeli civilians, the semantically correct term "Opfer" is used in the following examples:

Example 42: *„Deutschland soll uns nicht im Stich lassen". Wütender Appell von* ***Hamas-Opfer***[51];

Example 43: *Terroristen verschicken SMS mit Handys ihrer* ***Opfer***[52]**;**

Example 44: *Tel Aviv: 1000* ***Opfer*** *in Kühlcontainern – Jeder Tote erzählt vom Grauen des Terrors*[53]

Example 45: ***Hamas-Opfer*** *berichtet bei „Maischberger"„Es sah aus wie in Hiroshima"*[54]*;*

Example 46: *BILD erinnert an die* ***Hamas-Opfer.*** *Bringt die Geiseln zurück!*[55]*;*

The following examples point to the description of the civilian population in Gaza suffering violent war casualties by bombing and violent actions of the Israeli military with the term "Zivilisten" (in English: civil), although, like the above examples, it would be more appropriate to call them victims. In addition to the fact that the plight of Palestinian civilians is not described by an adequate term ("Opfer", English: victim), the claims about their plight are also questioned, because the first example deals with the arguments cited by pro-Palestinian profiles on social networks, namely "zehntausendfach" (English: ten thousand times), and because of the "source", the credibility of the suffering is questioned, while in the second example, the bombing of civilians is also linked to the "worst lies in Gaza", which are revealed by the Bild.

Example 47: *„Israelische Terroristen ermorden* ***Zivilisten****", kommentieren pro-palästinensische Accounts sinngemäß und zehntausendfach in den sozialen Medien.*[56]

Example 48: *„Israel bombardiert gezielt* ***Zivilisten!****" BILD entlarvt die schlimmsten Gaza-Lügen*[57]

children, eight mothers and twelve elderly women. On the other hand, Israel will release about 150 Palestinian women and minors(...)

51 https://www.bild.de/video/clip/politik/hamas-entfuehrt-familie-deutschland-soll-uns-nicht-im-stich-lassen-85721066.bild.html (Accessed 20th December 2023), article published on 11.10.2023). Example 42: Translation: "Germany must not leave us in the lurch". An appeal of anger from the victim of Hamas.

52 https://www.bild.de/news/ausland/news-ausland/terroristen-verschicken-sms-mit-handys-ihrer-opfer-85740968.bild.html (Accessed 21st December 2023), article published on 13.10.2023). Example 43: Translation: Terrorists use their victims' mobile phones to send text messages.

53 https://www.bild.de/news/ausland/news-ausland/tel-aviv-1000-opfer-in-kuehlcontainern-jeder-tote-erzaehlt-vom-grauen-des-terror-85752172.bild.html (Accessed 20th December 2023), article published on 16.10.2023). Example 44: Translation: Tel Aviv: 1000 victims in refrigerated containers - every dead person testifies to the horrors of terror.

54 https://www.bild.de/politik/ausland/politik-ausland/hamas-opfer-berichtet-bei-maischberger-es-sah-aus-wie-in-hiroshima-85782600.bild.html (Accessed 21st December 2023), article published on 2023). Example 45: Translation: Hamas victim reports on "Maischberger". "It looked like Hiroshima."

55 https://www.bild.de/video/clip/politik/bild-erinnert-an-die-hamas-opfer-bringt-die-geiseln-zurueck-86099408.bild.html (Accessed 21st December 2023), article published on 13.11.2023). Example 46: Translation: The Bild reminds of the victims of Hamas. Return the hostages!

56 https://www.bild.de/politik/ausland/politik-ausland/das-sterben-der-anderen-warum-man-mitgefuehl-mit-gaza-haben-muss-85907662.bild.html (Accessed 25th December 2023), article published o 31.10.2023). Example 47: Translation: "Israeli terrorists kill civilians", comment on pro-Palestinian profiles analogously and 10,000 times on social networks.

57 https://www.bild.de/politik/ausland/politik-ausland/israel-bombardiert-gezielt-zivilisten-bild-entlarvt-die-schlimmsten-ga-

The following example, in the first part, instead of the victims, lists only the geographical territory in which the victims lived, while the rest adequately describes the human casualties suffered by Israel:

Example 49: *Eklat bei Klimakonferenz. Schweigeminute* für Gaza, KEIN Wort *zu Israels* ***Opfern***.[58]

In the following example, with the linguistically correct collocation "civilian casualty", the legitimacy of published news from other sources (in this case the United Nations) is challenged:

Example 50: ***Zivile Opfer*** *in Gaza. Verbreitet die UN ungeprüft Hamas-Propaganda?*[59]

Conclusion

The article aimed at describing the war casualties of civilians in Gaza, Israel, and partially in Ukraine, using the example of the most widely read online portal in Germany, bild.de, in the period from 07.10.2023 to 22.12.2023. Semantically similar word pairs were used to describe the plight of civilians, and those are as follows:

sterben/töten/massakrieren/Massaker, Kinder/Minderjährige and Zivilisten/Opfer.

When it comes to the comparison of the first set of words (sterben, töten, massakrieren/Massaker), we have defined that **sterben** describes dying without violent killing, **töten** describes dying, but by violent means, while **massakrieren/Massaker** describes dying by violent means of a larger number of people

Analyzing the articles of the Bild.de, the most read news site in Germany, in the period from 07.10. – 22.12.2023, we noticed that the terms "töten" and massakrieren/Massaker in the "indicative" mood (mood describing reality) are consistently used to describe the plight of Israeli civilians. For Palestinian civilians, however, the verb "sterben," that is, a verb that mainly describes non-violent/natural dying, is used, and the remaining two verbs/forms, if already used, are expressed either in subjunctive II or in questionable forms, which greatly contributes to the risk that the recipients of such reporting may get a wrong or inadequate picture of the plight of a large number of Palestinian civilians in the bombings that have lasted since October 7, 2023, or from the day when a terrible crime was committed against Israeli civilians.

In another pair of words, Kinder /Minderjährige, used to report the plight of children, it is evident that the term children is also consistently used to indicate the plight of a large number of Israeli children on 7 October 2023, as well as a large number of those children who were taken and held hostage that day. It is indicative, however, that the suffering of Palestinian children (i.e. the use of the term Kind/Kinder) is not treated at all in the mood of "indicative" (i.e., real unambiguous mode), and the terms "Kind/Kinder" are either used through quotation marks (i.e., with distance, i.e. quotations of others with discrediting sources) or in subjunctive II or with additions "angeblich" and the like.

Finally, with the third pair of words, the use of which we analyzed in the period from October 7 to December 22, 2023 on the Bild.de news site, within the articles on reporting on the plight of civilians in Israel and Gaza, it is evident that the term "Opfer" was adequately used in the case of describing the plight of Israeli civilians. However, the term "Opfer" was practically not used in the indicative mood to describe the suffering of Palestinian civilians.

Bild.de also appropriately reported on the casualties of civilians and children in Ukraine, when they were victims of rocket fire or bombing using the terms "töten, Kinder, Opfer", which we cited as an additional comparative example.

However, we note that scientific observations and analyses have resulted in the realization that the reporting of the bild.de on the war suffering and plight of civilians in Gaza resorts to exaggeration (hyperbole) or mitigation (litote), or that for the same events, as the suffering of civilians in Israel and Ukraine during the war, adequate or

za-luegen-85742234.bild.html (Accessed 23rd December 2023), article published on 24.11.2023). Example 48: Translation: "Israel is bombing civilians on purpose!", BILD exposes Gaza's worst lies.

58 https://www.bild.de/politik/ausland/politik-ausland/schweigeminute-ignoriert-israels-opfer-gaza-eklat-bei-der-klimakonferenz-86279102.bild.html (Accessed 24th December 2023), article published on 30.11.2023). Example 49: Translation: Scandal at a climate change conference. A minute of silence for Gaza, NOT A word about the Israeli victims.

59 https://www.bild.de/politik/ausland/politik-ausland/zivile-opfer-in-gaza-verbreitet-die-un-ungeprueft-hamas-propaganda-85767658.bild.html (Accessed 20th December 2023), article published on 17.10.2023). Example 50: Translation: Civilian casualties in Gaza. Is the UN spreading Hamas propaganda without verification?

the same terminology is not used, which may affect the judgment of the recipients. It is necessary to use adequate linguistic terms and structures to describe the war suffering and plight of the civilian population in Gaza as well, in order to avoid the risk of erroneous reasoning and judgement when reporting, as apparently happens in the case of the bild.de with respect to the plight of Palestinian civilians in Gaza.

Given that language and language structures contain potential that can lead to both correct and incorrect reasoning and informing, it is of particular importance that reporters of significant, and especially globally important events, use adequate terms and structures with the aim of objectively reporting on the scale and consequences of those events.

In this particular case, we were convinced that the suffering, dying and plight of Israeli civilians were adequately, linguistically and stylistically appropriately described, but that adequate reporting on the horrific consequences of killing thousands of Palestinian civilians, including thousands of children, was lacking, which, due to the application of inadequate linguistic structures, inadequate verb forms or moods, poses a great risk and challenge for objectivity in reporting.

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ORIGINAL RESEARCH PAPER

VIRTUAL COMMUNITIES OF PRACTICE ON LINKEDIN: A STUDY ON SELF-DIRECTED, WORK-RELATED LEARNING

Elisabeth Franc[1], **Rita Stampfl**[2], **Barbara Geyer**[3]

[123] ***University of Applied Sciences Burgenland***, *Eisenstadt, Austria*

Correspondence concerning this article should be addressed to Rita Stampfl, University of Applied Sciences Burgenland, Eisenstadt, Austria. E-mail: rita.stampfl@fh-burgenland.at

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ABSTRACT

As a career network, LinkedIn offers access to a wide range of job-related information and a low-threshold opportunity for exchange among experts in various fields. The purpose of this study was to find out which LinkedIn functions are particularly useful for self-directed professional development and to what extent users' motivation to learn is influenced by their virtual community of practice (VCoP) on LinkedIn. Two approaches were taken to answer this question. First, a literature review on four different learning theories was conducted: self-directed learning, situated learning, social learning and connectivism. The learning mechanisms on social media were then put into the context of those four learning theories. Additionally, the specific potential of learning via social media and especially via LinkedIn was considered. Second, a qualitative interview study with LinkedIn users who were categorised as digital learning experts based on their education and/or profession was conducted. According to the results of the study, LinkedIn offers excellent conditions for professional development. Various functions such as consuming others' posts, writing own posts, comments or private messages and subscribing to hashtags or newsletters support work-related learning processes. The value of the LinkedIn Learning course platform is controversial. The results also show that VCoP activities can influence users' motivation to learn both positively and negatively. The LinkedIn activities of others can inspire users, but they can also cause social pressure. The results of the interview study represent an addition to the research field of "learning with social media" and can be used as recommendations for dealing with LinkedIn in order to broaden or deepen one's professional knowledge. This study especially highlights the use of LinkedIn for lifelong learning with the goal of professional development.

Keywords: learning with social media, LinkedIn, connectivism, self-directed learning, professional development, virtual community of practice

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Introduction

In the 21st century, technological developments are progressing at an unprecedented pace. As a result, new occupational fields are emerging every year and the requirements in existing professions are changing rapidly. For employees, this means that they must continuously develop their expertise and professional skills in order to survive in the labour market (Jacobs et al., 2017). Jacobs et al. (2017) cite three trends in lifelong learning: flexibility, participation and learning in networks. They point out that independence of time and place, cooperation with other learners and exchange with peers are decisive factors for learning processes in the 21st century. As social media platforms offer all of this, they represent suitable digital learning spaces for such learning processes.

According to an analysis by DataReportal, there were 7.37 million social media users in Austria in 2022, who spent an average of 91 minutes per day on 5-6 different social media platforms (Kemp, 2022). Analyses by NapoleonCat (2022) with regard to LinkedIn show that this platform was used by 1.9 million people in Austria and 14.4 million users in Germany in 2022. In both countries, around 60 per cent of LinkedIn users are between 25 and 34 years old (Napoleon Cat, 2022) and therefore belong to Generation Y. Generation Y is the successor generation to Generation X and was born towards the end of the 20th century. Depending on the author, there is a slightly different demarcation by year. It roughly summarises the birth cohorts between 1977 and 2000 (Howe & Strauss, 2000; Klaffke, 2014; Williams et al., 2010). LinkedIn, being a career network, offers a wealth of information on professionally relevant topics as well as access to expert knowledge. Therefore, many people use LinkedIn for self-directed, professional development, some of them deliberately, but many also without realising it (Dron & Anderson, 2021). Although there are already studies on other social networks, little research has been conducted into the learning potential of LinkedIn. The interview study conducted aimed to investigate the mechanisms of work-related learning on LinkedIn in order to enable users to make more conscious decisions when using the platform as a learning tool, so that they can specifically expand their skills with the help of LinkedIn.

Theoretical Background

Self-directed learning has become increasingly important in the 21st century, as the half-life of job-related knowledge is decreasing at an ever-faster rate (Friedrich, n.d.). In self-directed learning processes, the learners themselves decide on the learning content, learning objectives, necessary resources, learning methods, time frame and the method(s) with which they check the achievement of their learning objectives (Friedrich, n.d.). Social media offer an enormous amount of information that learners can utilise independently in their various learning projects. Due to the non-linear information character of social media, it is necessary for users to control their own learning process, e.g. the choice of learning content and learning paths (Iske & Meder, 2010). According to Guglielmino et al. (2009), self-directed learners are not only interested in their own further development, but also like to share their knowledge with others. Social media offer perfect opportunities for this. Looking at Oswalt's (2003) model for self-directed learning, it is clear that social media provide the necessary context to enable self-directed learning.

According to the theory of situated learning, learning opportunities arise from a situation. This means that the acquisition of new competences in learning processes is strongly context-bound (Koring, 2012). Renkl (2020) describes knowledge acquisition according to the rules of situated learning as results from the relation or interaction between a person and a situation. For example, knowledge is constituted in cooperation with other learners, whereby the type of interaction determines which knowledge is created. Situated learning therefore takes place in an exchange between learners and always includes the context in which the discourse takes place.

Schmohl (2021) also refers to situated learning as experiential learning and shows that it can be initiated not only in analogue but also digital environments. Smart et al. (2017) describe the internet as "an increasingly important part of the material environment in which an ever-expanding array of human cognitive and epistemic activities unfold" (p. 253). As the internet is now a large part of everyday life, it can also be categorised as one of many contexts in which people move around. Social media and networks have the potential to create the necessary context for collaborative, situated learning to take place across boundaries of time and place. The members of VCoPs in social networks can communicate and collaborate with each other synchronously or asynchronously and gain context-bound knowledge in the process of cooperation.

Generally speaking, social learning takes place where people exchange ideas and collaboratively develop products (Wenger, 2000). Interaction with others enables the confirmation of one's own knowledge, supplemented by new interpretations and contexts (Dron & Anderson, 2021). Wenger (2000) describes communities of practice (CoPs) as the "basic building blocks of a social learning system" (p. 229). If these communities do not meet in physical but in digital space to exchange ideas, they are referred to as virtual communities of practice, or VCoPs for short (Bourhis et al., 2005). Learning processes are triggered by the exchange of knowledge itself. Reed et al. (2010) name three criteria that must be met in order to be able to speak of a social learning process: Firstly, the learner's understanding of a particular topic must change; secondly, this change must be visible to others, such as the members of the learner's CoP; and thirdly, the learning process must have taken place in social interaction with other people. For the latter, it is irrelevant whether the social interaction takes place online or offline.

Social learning takes place in social media through casual exchange among the network contacts. It happens incidentally through informal communication via social media (Kerres et al., 2017). Mutual interest serves as a catalyst for these learning processes (Kerres & Rehm, 2014). According to Kerres and Rehm (2014), the willingness to share knowledge on social media is increased by the following factors: users hope to gain broader access to the knowledge of others, recognition, a better position within their social media community and a boost of their social capital.

The theory of connectivism places social learning in the context of online networks (Duke et al., 2013). It was founded by George Siemens and Stephen Downes at the beginning of the 21st century and states that learning takes place through networking with others. Through joint participation in a network, knowledge and experience is shared among the respective members (Downes, 2006). However, networking in the sense of connectivism not only refers to the connection of individual learners, but also to the linking of information that is found in different places on the Internet, resulting in new insights. Thus, the theory of connectivism deals with connections on two levels: the neuronal link of concepts and ideas that is built when consuming and engaging with different information, and the social connection between people that arises through communication in social networks (Dunaway, 2011).

According to Siemens (2008), learning takes place online in networks in which individuals move around. The ideas jointly generated in the network, which are based on the connection of a wide variety of information, are the product of connectivist learning activities (Sîrghea, 2020). Exploring the information provided by others can lead to the acquisition of valuable knowledge and to a change in one's own way of thinking and acting (Iske & Meder, 2010). Networks enrich the learning process by allowing different people to express different points of views on topics and issues, thus enabling the acquisition of a diverse perspective that an individual cannot develop alone (Duke et al., 2013).

Literature review

Social media, including social networks, now offer a huge circle of users the opportunity to participate in social knowledge communication (Kerres et al., 2011). They have revolutionised the dissemination of information and knowledge by enabling a balance between producers and consumers, in contrast to traditional media (Chu, 2020). On the one hand, learning with social media consists of searching for, sorting out and combining incomplete information units (Dede, 2005). On the other hand, exchanging information with other users offers the opportunity to learn from and with each other. Spanhel (2017) therefore describes social media as spaces of opportunity for situated educational processes in which learning takes place through communication.

According to Akkerman and Bakker (2011), expertise does not only mean the development of expert knowledge through learning processes within one's own boundaries, but especially beyond these boundaries. The virtual space creates independence from the usual spatial and temporal limitations of offline learning settings and enables people and organisations to generate and share content (Duong-Trung, 2017). In addition, social media has an immersive and omnipresent character (Deaton, 2015). By ongoing notifications, users are repeatedly prompted to visit the respective social media platform and continue interacting with other users (Deaton, 2015). As a result, they regularly engage in exchanges that offer a high learning potential. It is interesting to note that the learning processes in social media often take place unnoticed, without the participants describing it as a learning activity (Kerres & Rehm, 2014).

Social media as learning media have a variety of positive effects on learners. Among other

things, they promote autonomy, personal responsibility for the learning process, self-confidence in the role as a learner, curiosity, collaborative problem-solving skills, critical thinking, a multi-layered perspective on learning topics and the freedom to choose learning activities that suit the individual (Sîrghea, 2020). By sharing their knowledge, users deepen it, because first, it requires a profound understanding to convey one's knowledge in an understandable and concise way, and second, other users can provide new contexts in which the knowledge can be applied (Dron & Anderson, 2021).

Representatives of the Generation Y make particularly frequent use of the internet and especially social media for continuing education (Göbli & Rami, 2017). This is not surprising, as social media fulfil many of the needs of this generation: Practical relevance, exchange with peers, direct communication and low-threshold access to information. However, learning with social media does not only offer advantages. Gkotsis and Tsirakis (2010) warn that the enormous amount of information found on social media can lead to learners being overwhelmed if, for example, they find it difficult to separate relevant from irrelevant content. Dinath (2021) also writes about a possible "information overload" (p. 1) that makes it difficult for users to find the bits of information they are looking for.

The social network LinkedIn is a business network. Users have different access to information depending on whether they have a paid premium membership or not (Unterschied zwischen kostenlosen LinkedIn Konten und Premium LinkedIn Konten, 2023). LinkedIn users usually network with people who have similar interests. They exchange information and comment on each other's published posts (Oyarzun et al., 2011). When social contacts are established through bridging, i.e. entering into loose connections with other users, it is assumed that individuals have the greatest potential to gather new information, acquire social capital and initiate informal learning processes (Rehm, 2018). LinkedIn can be used to post, read and comment on text, image and video posts, exchange private messages, create or join public and private groups, attend or host live online events and send newsletters, among other things. Some users also use LinkedIn for blogging in order to share their expertise in certain professional fields (Sharma, 2022).

As a career network, LinkedIn provides the perfect basis for the creation of diverse VCoPs that exchange information on current professional topics and challenges. Hara (2010) sees the great learning potential of CoPs in the fact that they favour informal learning processes and thus disseminate three types of knowledge: cultural, practical and theoretical knowledge. People from all over the world network on LinkedIn and form VCoPs, which makes it possible to achieve a high degree of diversity. According to Dron and Anderson (2021), this diversity increases the likelihood of users being confronted with different perspectives on topics, which challenges their own attitudes and stimulates a discourse that leads to a broader understanding of the respective topics.

In addition to the network of contacts, LinkedIn also integrates a paid training platform known as LinkedIn Learning (LIL). LIL is a digital learning platform that offers over 16,000 online courses on a wide range of job-related topics (Pomykalski, 2022). Trained experts with practical experience from the business world create the online courses on offer, most of which are provided in video format (Olson & Segovia, 2021). There are also courses in audio format. One advantage of the LIL offer is the possibility of strongly individualising the learning path according to one's own needs and preferences. Since it is a learning offer of a social network platform, social elements must not be missing. Users can therefore see which courses other users like. They can also recommend LIL courses to their contacts or share their own collections of different LIL courses with their network (Kennedy, 2019). Furthermore, the description of the respective courses includes information on how many LinkedIn users have already consumed them and in which professional fields they work (Grotlüschen, 2018).

Current study

Aim and research questions

There are numerous studies on learning mechanisms in social media. These deal with both platform-related and user-related characteristics (Wang & Xie, 2022), with different social media platforms such as LinkedIn (Li et al., 2018; Angadi, 2019), YouTube and Twitter (Burchert & Burchert, 2018), with age-specific learning preferences (Göbli & Rami, 2017) and the formation of learning communities in social networks (Castillo-de Mesa & Gómez-Jacinto, 2020). Shwartz-Asher et al. (2020) researched user behaviour and intentions when sharing knowledge on social media. However, very little research has been conducted concerning the learning mechanisms on LinkedIn. Therefore, the

present study investigated the use of LinkedIn for self-directed, work-related learning. The aim was to raise awareness of the learning opportunities offered by social media.

This study was guided by the research question of how LinkedIn is used by Generation Y digital learning experts in Austria and Germany for self-directed, work-related learning. Two sub-questions provided the necessary focus to further delimit the research topic. Sub-question one focussed on the suitability of various LinkedIn functions for work-related learning: How are the different LinkedIn functions used by digital learning experts for self-directed, work-based learning? The second sub-question dealt with the influence of the Virtual Community of Practice on users' motivation to learn: To what extent do the activities of the VCoP of digital learning experts on LinkedIn influence their work-related motivation to learn?

The interview study was intended to make the learning mechanisms on LinkedIn more transparent. The results should help LinkedIn users to make conscious learning decisions to continuously expand their professional expertise with the help of LinkedIn.

Methodology

To address the questions posed, the study employed a qualitative research methodology to gain insights into the experiences of LinkedIn users. This research was exploratory in nature, an approach particularly effective for examining phenomena that are not yet fully understood. Opting for a qualitative over a quantitative method was intentional, as the former is more adept at providing a nuanced understanding of complex social interactions (Eisenhardt & Graebner, 2007). The activities of Generation Y users while navigating the social media platform LinkedIn demonstrate such social interactions. The interpretation of data analysis results differs based on the underlying philosophical perspective of the researcher. Hence, comprehending the study's outcomes necessitates recognition and clarity regarding the researcher's foundational philosophical position, a notion emphasised by Biedenbach and Müller (2011). The researcher's intrinsic philosophical viewpoint aligns with phenomenalist principles. This led to the research effort focusing on developing insights into the personal experiences of digital learners.

Participants

A purposive sampling strategy was chosen for the selection of participants**.** "The [purposive] sampling design is based on the judgement of the researcher as to who will provide the best information to succeed for the objectives study" (Etikan & Bala, 2017, p. 215). Specifically, the homogeneous sampling procedure was used: "[Homogenous sampling] focuses on candidates who share similar traits or specific characteristics" (Etikan et al., 2016, p. 3). The following criteria were prerequisites for the permission to participate in the interview study:

The LinkedIn users needed to

- be born between 1977 and 2000 and therefore belong to the Generation Y
- live and work in Austria or Germany
- have, for at least one year in the last five years, worked in a profession in which they have been centrally involved with digital learning and/or have completed at least 1 year of training in the field of digital learning
- have been regularly (= several times a month, ideally several times a week) active on LinkedIn. "Active" meant: reading/reacting to posts and comments from others, posting own posts, sending private messages or consuming LinkedIn Learning content. Not everything had to be given.

Suitable participants were sought exclusively via LinkedIn. The size of the sample was set at twelve people, and the detailed information on their qualification can be found in Table 1.

Instrument and Data collection

The method chosen to collect the required data was a qualitative study using expert interviews with LinkedIn users who could be categorised as digital learning experts based on their education and/or professional experience. The interviews were conducted according to the method of Bogner et al. (2014) and are of a theory-generating nature.

The preparation for the qualitative interviews was based on the theory of Bogner et al. (2014) and was carried out with the support of the interview manual by Helfferich (2011). The interviews focussed on the experts' interpretive knowledge of the learning potential of LinkedIn.

Table 1.
Information on the interviewed experts

Person	Residence & workplace	Year of birth	Professional experience	Education
1	Germany	1988	2019 work in personnel development with a focus on digital education, then e-learning and blended learning consultant at an agency, since 2022 designing learning experiences in the metaverse at a 3D company	2020 completion of a certificate programme in e-learning with a duration of 3 semesters
2	Germany	1985	Working in the in the field of „digital education" since 2008, primarily employed at universities, also in a professorship, additionally employed as well as self-employed activities in the private sector, e.g. training, LMS consulting, learning process support	2010 master's degree in education, psychology and linguistics with an additional focus on „virtual learning"
3	Austria	1980	Working in Learning & Development since 2018, supporting employees with questions about e-learning, and creating e-learning courses as an employee since 2020	
4	Germany	1981	Creating e-learning courses for private companies since 2009, lecturer for e-learning at an online university from 2015-2017	2021 Completion of the master's programme „Educational Leadership" with a focus on e-learning
5	Germany	1978	Working with digital learning formats in the school context since 2006, as a (digital) learning consultant & trainer in the private sector since 2018	
6	Austria	1984	Working as an e-learning specialist since 2018, primarily creating and designing e-learning courses in the private sector, but also working as an e-learning project manager	
7	Germany	1980	2013-2021 work in the field of digital learning at a university, management consultancy in relation to digital learning solutions since 2021	
8	Germany	1988	Independent consultant in the areas of coaching, learning culture development and digital learning in the corporate context since 2018	
9	Germany	1986	2018-2023 work as an instructional designer in the private sector, media educator in education since February 2023	2020 Completion of the master's degree programme „Media and Education" with a focus on digital learning
10	Germany	1986	Consultancy in the field of digital learning, work as an instructional designer and creator of story-driven e-learnings since 2017, teaching assignments at various universities on the topics of social media, storytelling & AI since 2019	
11	Austria	1986		2022 Completion of the master's programme „Applied Knowledge Management", which focused on e-learning
12	Austria	1979	Working in training and instructional design since 2010, responsible for the implementation and support of LMS as well as creation of digital learning content in various private companies	2015 Completion of the master's programme „E-Education"

Note. The experts have signed a consent form and have agreed to the use of the anonymised data.

As recommended by Helfferich (2019), a semi-structured interview guide was therefore created. Based on the research questions and the literature review, the following three thematic categories emerged:

1) Self-directed, work-related learning with the LinkedIn network
2) Influence of the VCoP on work-related learning motivation
3) Self-directed, work-related learning with LinkedIn Learning

One to five main questions, including some more detailed sub-questions, were developed for each of the three identified topics, as shown in Table 2.

The expert interviews were conducted between the end of March and the beginning of May 2023. A total of twelve experts were interviewed, with the shortest interview lasting 23 minutes and the longest 44 minutes. As the interviewees live all over Austria and Germany, the interviews were held online via MS Teams for economic reasons and recorded using the same tool.

The aim of the first thematic category of the guided expert interviews was to find out how various LinkedIn functions are used by the interviewees for self-directed learning. The second thematic category was used to talk to the interviewees about the influence that other LinkedIn contacts from similar professional fields have on their motivation to learn. The third thematic category was dedicated to the digital training platform LinkedIn Learning.

Table 2.
Interview guide

1. Information phase
Brief introduction to the study, purpose of the interview
2. Demographic data
Residence & workplace, year of birth, education and professional experience
3. Theme 1: Self-directed, work-related learning with the LinkedIn network
o Which LinkedIn functions do you use frequently and why? o In your opinion, which LinkedIn functions offer the greatest learning potential and why? o How do your activities on LinkedIn influence the further development of your professional expertise? o How do you gain new job-related information and insights through your LinkedIn network? o Have you already used LinkedIn specifically to pursue a specific learning goal? - If YES: What was your learning objective and how did you go about it? - If NO: What could be a learning objective and how would you proceed?
4. Theme 2: Influence of the VCoP on work-related learning motivation
o How do the activities of your LinkedIn contacts with similar professions and shared interest in digital learning motivate you to acquire more know-how about job-related topics? o How do the activities of your LinkedIn contacts with similar professions and shared interest in digital learning motivate you to share your expertise on LinkedIn? o How does the mutual exchange on LinkedIn positively influence your career-related learning motivation? o How do the activities of your LinkedIn contacts negatively influence your work-related learning motivation?
5. Theme 3: Self-directed, work-related learning with LinkedIn Learning
o Do you use LinkedIn Learning offers for your professional development? - If YES: How and how often do you use these offers? How would you rate the usefulness of LinkedIn Learning offers for your professional development? - If NO: Are you aware of the LinkedIn Learning offers? Why have you decided not to use them? Can you imagine using them in the future? - If yes, why and how? - If no, why not?
6. Fade Out
Is there anything else you would like to add?

Note. During the interviews, the guide served mainly as a memory aid rather than as a script to be read verbatim.

The interviewees were asked about the reasons for and against using this service and their ratings of the overall quality of LinkedIn Learning courses. All interviews were transcribed by the interviewer herself with the help of the AI tool "Whisper". The transcription rules recommended by Kuckartz (2018) were followed.

Data analysis

The next step was a structuring content analysis according to Kuckartz and Rädiker (2022). A deductive-inductive categorisation was chosen for the structured analysis of the interviews (Kuckartz, 2018). The computer-aided analysis was carried out using the MAXQDA software, which was developed by Kuckartz (2010).

Before the first review of the generated material, four main deductive categories were formed based on the literature section, the current state of research and the topics of the interview guideline: LinkedIn functions, LinkedIn Learning, learning motivation and learning through the network. During the first coding process, several subcategories crystallised for each of the four main categories, which enabled further differentiation of the data obtained. The corresponding material was assigned to the inductively formed subcategories in a second run. Before analysing the generated data material, the categories were described in detail, including anchor examples.

Results

The following findings regarding the suitability of various LinkedIn functions for professional development were obtained: Consuming and commenting on the LinkedIn posts of others as well as writing your own posts offers a high learning potential. The passive consumption of posts often comes along with inspiration for new learning topics, offering concise summaries of current trends and tool tips. Active posting requires even more activity, as it requires conscious topic identification, target group-orientated formulation, publication and follow-up. The following statement from an interview illustrates this: "When I post myself, I naturally give it some thought. What do I want to post, what do I want to get across and content and then I try to post something with added value. [...] Because I deal with the topic more intensively when I write an article or a post like this, I learn more or, let's say, deepen my knowledge in the specific area a bit, or repeat it again" (Participant 9, pos. 65). Actively creating your own posts deepens existing knowledge and breaks it down to the essential elements. In addition, the publication of a post is accompanied by the opening of a learning space in the form of the comments column, where other users can share opinions, information and experiences. The private message function of LinkedIn primarily serves three purposes: distributing information found on LinkedIn, targeting questions to one particular person or just a few people and initiating a more in-depth, professional exchange. Thematic LinkedIn groups also offer a good opportunity for more intensive exchange, but are used relatively rarely by the interviewees. The main benefit of hashtags for the further development of professional expertise is that the radius for obtaining information is expanded by its usage. In two interviews, it was emphasised positively that hashtags are a way of consuming posts from people outside the network, as the following two excerpts show: "So I also follow these hashtags [...] that I also get the topics displayed by complete strangers. That's how I discover new things" (Participant 9, pos. 129). "They expand the people a bit. The topics remain the same, of course, as does my algorithm, but that helps me to get other people in the feed than the ones I follow" (Participant 5, pos. 147). This opens up access to more diverse perspectives than can be found in one's own limited network of LinkedIn contacts or in conventional LinkedIn groups. Furthermore, LinkedIn newsletters are also a suitable source of information.

Half of the interviewees had already used the LinkedIn Learning training programme. One participant emphasised that they build in reflection times during the courses in order to process what they have learned and transfer it to their own work context. This means that a LinkedIn Learning course is also consumed in several stages: "You also need time to process things, so to speak, and perhaps also to think, okay, what have I just heard, how can I somehow implement and realise the whole thing for myself" (SH, pos. 49). LinkedIn Learning tends to be used to deal more extensively with larger subject areas that are currently needed in the work context: "Where I learnt the most in LinkedIn was when I dealt with it for a longer period of time, i.e. in these LinkedIn Learning courses" (ND, pos. 102). During the interviews, a number of reasons were given both for and against its use. For the participants, the following aspects were decisive for using LinkedIn Learning: the perceived high-quality implementation of the courses, trust in the expertise of the lecturers and thus in the quality of the content offered and the receipt of certificates for completed courses.

Among the dissenting voices, there were the following reasons that prevented users from taking advantage of the training offer: the amount of the costs and the payment model in subscription form, lack of topicality of the content, insufficient trust in the expertise of the lecturers, a poor assessment of the video quality, the passivity of the dominant video format, lack of variety and the length of the courses. It is important to note that the respondents are digital learning experts who, due to their profession, probably have a more critical view of LinkedIn Learning than other LinkedIn users.

All participants were also asked what influence the activities of their LinkedIn contacts had on their own career-related motivation to learn. In particular, they were asked to what extent the activities of their VCoPs, consisting of people with similar professional backgrounds, influence their motivation to further develop their own knowledge. Participant 2 referred to the self-determination theory of Deci and Ryan (2022) in the course of the question about how the use of LinkedIn influences their own motivation to learn, whereby one of the motivational factors is social integration: "I'll now briefly refer to Deci and Ryan and self-determination theory and thus also the topic of learning motivation, of course. Yes, I am assuming three basic needs, the experience of competence, the need for autonomy and social integration. And in the end, LinkedIn offers everything here. In other words, if I post something or comment or do something else, I can feel competent if everyone agrees with me and likes me. […] At the same time … it's up to me whether I read something, whether it interests me and whether I follow the whole thing …. And of course, the social autonomy, I mean, it's a community, people comment on it, there's discussion, it's actually like that too, which can be very motivating" (pos. 105). According to the interviewed digital learning experts, following factors can have a favourable effect on the learning motivation of LinkedIn users:

- Trust in the expertise of other users and in the quality of the content they provide
- Insights into the perspectives of other LinkedIn contacts
- Thought leadership from prominent users who regularly present their views on current topics
- Positive competitive thinking
- Practical relevance in the contributions of other users
- Positive reactions to one's own posts
- Social inclusion and the desire to make a contribution to the community to help others
- Experience of autonomy and competence

The following factors that can have a negative effect on LinkedIn users' motivation to learn were mentioned:

- Mental overload due to information overload
- The "endlessness" of content in the feed
- Social pressure
- Difficult retrieval of content

Thus, only half as many negative as positive aspects influencing users' career-related learning motivation could be found during the analysis of the interviews.

Furthermore, in the various interviews, both the positive and negative effects of LinkedIn's underlying algorithm were discussed. Overall, there was a consensus that the LinkedIn algorithm has a lot of influence and that it is challenging to manipulate it according to individual needs. This is made clear by the following statement: "On the one hand, this biased and also very often condensed content tailored to your own preferences on social networks is good, because you usually get the content that interests you, but at the same time it also narrows your horizons to a certain extent. And in the end, you have to actively counteract this if you don't want to" (Participant 11, pos. 102). While some appreciate that it facilitates network building and curates posts according to prevailing interests, others feel restricted as the algorithm contributes to a lack of diversity in the network and feed and pushes polarising and superficial posts more than detailed, in-depth posts.

In general, LinkedIn offers users the opportunity to build a targeted network of people working in similar professional fields and create a virtual community of practice in which knowledge is shared, new perspectives are opened up and collaborations are initiated. The majority of interview-

ees emphasised the pronounced learning potential that results from a network of experts tailored to their own needs. One of the strengths of building a network via LinkedIn is that users have the opportunity to exchange ideas with a large number of experts and thus gain access to a wide range of opinions and experiences. This allows users to actively broaden their horizons. Many of the respondents described LinkedIn as a source of inspiration for current, career-related topics. According to the interviewees, regular use of LinkedIn supports the expansion of their own knowledge by providing insights into the working realities of others and by presenting and discussing different perspectives. One participant emphasised that, in her opinion, the exchange between experts on LinkedIn offers the greatest learning potential: "The real peer-to-peer exchange. In other words, with people who are either in my field or in neighbouring fields and then really take the time to talk to you, whether it's in the comments or in personal messages or in a meeting. I think that helps you the most" (Participant 10, pos. 41). In the feed, users also repeatedly come across concrete tips on new tools and methods and how to use them, which are transferable to their own work context. As a result, users repeatedly reflect on their own level of knowledge, examine different perspectives on familiar as well as new tools or topics and, if necessary, adapt their behaviour. Thus, by regularly using LinkedIn, users constantly encounter new trends, tools, methods, etc., which they can subsequently analyse in more detail if they are relevant to their own field of work.

Discussion

Kerres et al. (2011) already emphasised the high degree of self-control of learning processes in social networks. The fact that this applies to LinkedIn was confirmed by the present study. LinkedIn offers all the core components that are important for self-directed learning according to Oswalt (2003). These include the possibility of self-directed learning processes through the various functions offered, the integration into a virtual learning community, mechanisms that stimulate the intrinsic learning motivation of the users, and a rich context of learning content and the people who provide this content.

Many situations mentioned in the interviews also combine the characteristics of situated learning by Herrington and Oliver (2000): authentic context, observation of experts, collaborative knowledge construction, changing roles and perspectives as well as explication of implicit knowledge through articulation. Spanhel's (2017) thesis that social media enable situated educational processes in which learning takes place through communication could therefore be confirmed too.

The theory of social learning is also about the exchange between people and the resulting learning experiences or products (Wenger, 2000). All of the people who took part in this interview study consciously network with people on LinkedIn who have similar areas of interest in order to learn from them. Through their activities on LinkedIn, the interviewees are repeatedly involved in processes of social learning, in which they contribute information and experiences from which others can learn. Moreover, they use the contributions of their network contacts and the interaction with other users to expand their own expertise.

The theory of connectivism deals with two central aspects that favour learning processes: the networking of individual learners and the linking of information (Dunaway, 2011). LinkedIn is a digital place where, according to the participants, it is easy to network with people and gather information from a wide range of sources. Links to articles, podcast episodes, websites, contributions by others, etc. are shared and complemented with one's own thoughts or additional information. This networking of information represents products of connectivist learning activities (Sîrghea, 2020). All interviewees appreciated the fact that they are constantly confronted with new topics and perspectives through LinkedIn. They consistently showed a willingness to reflect on their knowledge based on this and update it if necessary, a central ability for successful learning in networks according to Duke et al. (2013).

Kerres et al. (2011) postulate that learning in social networks takes place primarily through the transfer of knowledge between peers. This was confirmed many times in the interviews. According to Akkerman and Bakker (2011), expert knowledge is created through learning processes beyond one's own boundaries. They describe how boundary crossing can lead to an exchange between different worlds with people from diverse realities. In the interviews, it was emphasised several times that LinkedIn makes it easier to network with experts across analogue borders. All in all, many of the existing theories on the learning potential of social media were substantiated by this interview study.

Conclusions

The interview study with Generation Y digital learning experts from Austria and Germany shows that although LinkedIn is used differently for learning purposes, certain patterns can be recognised. The following functions proved to be particularly useful: consuming and commenting on posts, creating posts, exchanging private messages and subscribing to hashtags or newsletters. While passive activities such as consuming posts or newsletters provide inspiration and an overview of new trends, activities such as writing posts, comments or private messages promote the exchange and deepening of knowledge and can therefore lead to new insights. The use of LinkedIn Learning is controversial, with more arguments being put forward against its use than in favour of it. The lack of quality and currency of the content, the poor technical implementation and the high costs were criticised by some, while other users rated the quality of the content and the receipt of certificates positively.

LinkedIn offers low-threshold access to practical insights and information about the professional world. The network of LinkedIn contacts, especially the users from similar professional fields, represents a VCoP for users and promotes the exchange of knowledge. The content on LinkedIn serves as inspiration and impetus for further reflection and engagement with various topics. LinkedIn is used by the experts surveyed to follow trends in their professional field and to further their professional development.

The effects of the VCoP on learning motivation were considered in a differentiated manner by the participants, with twice as many positive as negative influencing factors being mentioned. Positive factors include trust in the expertise of the VCoP members, insights into other perspectives, positive competitive thinking and high practical relevance. These lead to an increased motivation regarding the engagement with the content on LinkedIn. Positive reactions to one's own contributions, social inclusion and a sense of competence increase the willingness to actively participate in the discourse. Negative factors include social pressure, information overload and difficulties in retrieving content. These can reduce the users' motivation to learn.

The results of this study are that the content on LinkedIn often serves as a starting point for deeper reflection and exploration of the issues at hand. In the feed, users regularly come across concrete tips on new methods, tools or how to use them that are transferable to their own work context. When asked about the use of specific LinkedIn features for professional development purposes, the following basic features were found to be particularly useful: reading, commenting and posting posts, exchanging private messages and subscribing to hashtags and newsletters. These implications can already help users to consciously use LinkedIn as a learning tool according to their personal preferences. Different LinkedIn functions, which require different learning processes, can be used to develop professional expertise. Among the active functions, posting one's own contributions seems to hold a great learning potential, as existing knowledge can be deepened and new perspectives can be gained through comments.

Limitations and future directions

When conducting the interviews, the researcher's blind spots became apparent time and again when talking about the various options offered by LinkedIn. This potentially falsifies the results of the study because there was an unconscious focus on certain LinkedIn functions. More intensive preparation would have allowed the interviewer to ask even more specific questions about a wider range of existing LinkedIn functions and their use for professional development.

In addition, the fact that the researcher herself prepared, conducted and transcribed the interviews led to a high degree of familiarity with the material. The absence of another person in the coding process is limiting in that there was no discussion about the definition of suitable subcategories or the appropriate assignment of statements to certain categories, and the decisions were therefore based solely on the subjective judgement of the researcher.

Due to limited time resources and the specifications regarding the scope of the work on the part of the university at which this study was supervised, no more than twelve interviews could be conducted and analysed. Thus, it was not possible to achieve theoretical saturation.

Moreover, the group selected for the study consists of experts in digital learning and therefore of people who already had a certain amount of prior knowledge of learning theories and the learning possibilities of the digital space at the time of the interviews. This certainly had an impact on their pre-

sented usage patterns and perspectives on LinkedIn as a learning tool. For the reasons mentioned above, the insights gained from the interview study cannot be applied in full to all LinkedIn users.

In order to strengthen the validity of the findings obtained, additional qualitative and quantitative studies on the research subject of this work are recommended. A quantitative survey with a larger group of people on the LinkedIn functions used for the purposes of continuing professional development would be just as conceivable to verify the findings obtained here as further qualitative interview studies with other target groups on the question of the influence of VCoP on work-related learning motivation.

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