MyPad as a reflection of multimodal action in elementary school children's foreign language learning

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Abstract

A Mypad as a teaching aid can be a bridge or a border in children's learning of expression and communication, depending on how and why it is used. Onto genetic and phylogenetic aspects are among the most important in a child's development, i. e. teaching children to talk. Multimodality refers to communication and integration using various channels. The term "multimodal" refers to expressing a reflective attitude using combinations of words and symbols, pictures, sounds, and all different aspects of a child's communication development. It is why this paper aims to examine how children use MyPads in special circumstances and tasks while concluding their use of linguistic forms and media competencies; the paper aims to answer whether the MyPad contributes to the development of linguistic and digital competencies in kids, as well as how such multimodal content is designed in the MyPad. The target group of respondents will be elementary school children 4 and 5 in the Municipality of Okrug Gornji Petar Berislavić, who will be allocated MyPads of elementary school children in learning a foreign language. The research the instrument will be a questionnaire, while the multimodal content will comprise four modio systems: pictures, sounds, video, and text. The planned activity survey is from 1 June to 15 June 2019. Expected results will aim to answer the stated questions and point towards the necessity of multimodality as an antipode of the development of linguistic and digital competencies in preschoolers.

Keywords: multimodality; language and digital competence; educational software; MyPad; language learning

1. Introduction

Successful integration of information and communication technologies into schools imply the development of a Technology Integration Plan in the learning and teaching process. New technologies offer many opportunities to adapt teaching methods to the individual needs of students, so it is essential to plan and apply digital technology with students with special educational needs.

The information age is also known as post-industrial society. The term was introduced in 1973 in the study. The Coming of the Post-Industrial Society by sociologist Daniel Bell, which states that the main axis of society is theoretical knowledge and that knowledge-based services are becoming the central structure of the new economy. It is about an information-led society in which ideologies become redundant. Information, technology, and knowledge play a central role in the information age.

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In all sectors, the economy, economy, and education, new technologies and new media are the main focus. Changes are visible in the field of politics (e.g. digitalization of electoral processes, e-governments, e-parliaments), culture (promotion of cultural identities, creation of new cultures), but also in the mass media (Milardović, 2010). The media are indispensable in everyday life, but also in the teaching process. In a didactic sense, we can speak of media only when reproductive means and material carriers become carriers and mediators of information when technology and information transfer are networked in a didactic function (Dohmen, 1976). Teaching media comes in several forms. They are used as tools, and tools can be a teaching topic (Aufenanger, 2004). This involves learning through the media, individually or in groups (auxiliary), the preparation of educational media, the independent creation by students and teachers who produce a media educational product (tool), and learning about the media, especially new ones, where digital logic and algorithmic thinking need to be discussed (media as a teaching topic) (Dohmen, 2001; Hug, 2007). However, it is important to strive to answer the question of how to train a teacher to work with new media and how to empower students to apply new technologies for educational purposes. In the education of future professionals, who would work with different computer programs as digital tools to facilitate the teaching process, at least three areas should be represented that will cover media and information technology in education and teaching (Moser, 2006, 2015; Köck, 1997).

The development of technology allows us to use other multimedia elements besides text and image - audio, video, various simulations, and animations, etc. We must take into account how different elements work together and how they affect the learning process and the acquisition of knowledge. Equally important is the choice of tools and multimedia software that one may use to educate. The notion of multimodality occurred in the early 2000s (Kress and van Leeuwen, 2001; Jewitt, 2009). As a reason for multimodality, Kress (2010) states that the world of communication has changed and is still changing, and the reasons lie in the great intersection of social, economic, cultural, and technological changes. Multimodality refers to communication and interpretation through various channels commonly referred to as modes (Tayner, 1998; Kress, 2010). The term multimodality denotes the expression of reflective thinking through a combination of words and symbols, images, sounds, and all kinds of associations and activities (Stiller, 2007). Multimodal learning is an interdisciplinary approach to learning that refers to the use of multisensory and active learning approaches (e.g. images, art, film, video, and graphic organizers), combined with higher-order experiences such as interactivity. The development of technology has made it possible to use other multimedia elements in addition to text and image, such as sound, video, various simulations, animations, etc. The complexity of learning and teaching and their multi-modality became clearly apparent as the psychological, cognitive, social, and emotional aspects of learning were discovered and taken into consideration. Richard Mayer studied cognitive theory, supporting the idea that multimedia can help people learn content effectively and meaningfully. He outlined 8 principles that characterize the use of multimedia while learning: 1. Multimedia Principle: Students learn better when the teaching content is explained by the use of images and words; 2. Contiguity Principle: Students learn better if pictures and words are near during learning; 3. Temporal closeness: Students learn better if pictures and words are displayed simultaneously rather than alternately; 4. Principle of Concordance: Students learn better when unfamiliar terms are not at the forefront but are introduced in correlation with familiar concepts; 5. Modality Principle: Students learn better from content presented by animation and narration than from animations and text on screen; 6. Redundancy Principle: Students learn better from animation and narration than from animation, storytelling, and on-screen text; 7. Personalization Principle: the effects of design in teaching content are more stimulating to students with less intellectual ability and 8. The Principle of Direct manipulation: as the complexity of the material increases, the impact of direct material handling (animation, pace ...) also increases. The use of multimedia is extremely important in online education because the lecturer is usually not physically

present with the trainees to attract their attention, motivate them to learn, and explain or clarify the contents that the trainees find difficult or under-understood (Moreno, Mayer, 2007).

Positive effects of multimedia are: attracting the attention of the participants, a greater level of interest, motivation, and satisfaction of the participants, the possibility of easier clarification of difficult concepts and principles, a fuller understanding of the content and a more effective acquisition of new concepts and a better memory of the content and the ability to apply knowledge in new situations (Tolić, 2015). Teachers benefit greatly from the use of iPods in teaching, as they enhance classical classroom teaching with multimedia-based projects. A software package such as the iPod's life (which includes programs such as iMovie, GarageBand, iPhoto and iWeb) allows students to create and transfer teaching content. Students' learning ability is conditioned by the way the subject is presented.

1.1. Literature review

There are many ways in which we're not using technology in good ways, and yet there's still the excitement over new technologies. We're naturally excited by the new and shiny, but is there any substance behind the hype? Young people need to be able to communicate effectively in an increasingly multimodal world. This requires teaching children how to comprehend and compose meaning across diverse, rich, and potentially complex, forms of multimodal text, and to do so using a range of different meaning modes (Aufenanger, 2004; Tolić, 2015). "As communication practices have become increasingly shaped by developments in information and multimedia technologies, it is no longer possible for us to think about literacy solely as a linguistic accomplishment" (Tayner, 1998, p. 36). Multimodal is the combination of two or more of these modes to create meaning. Most of the texts that we use are multimodal, including picture books, text books, graphic novels, films, e-posters, web pages, and oral storytelling as they require different modes to be used to make meaning. Each individual mode uses unique semiotic resources to create meaning (Moreno; Mayer, 2007) and teaching of these needs to be explicit. Multimodal learning involves relating information from multiple sources. Technology-based foreign language teaching has provided many effective strategies in the learning process. Köck, P., Doolittle, P. (1997), means that "the use of technology in teaching leads to a good command of the target language with ease" (p. 45). Learners stand a better chance of improving their foreign language skills if learning is strengthened with technology; therefore, technology-aided learning environment is a key factor that motivates the learners to accomplish better (Moser, 2015; 2006, p. 89). As information technologies evolve and advance over time, use of technology in classrooms has increased in the classroom. There is a wide spread belief that technology-based instruction can contribute greatly to the quality of teaching and learning experience. Technology is a facilitating tool of education which teachers and students get a great deal of benefit from. Today's language teachers need to learn how to take advantage of the technology and how to integrate it into their teaching skills. Computers, smart phones, tablets etc. provide powerful opportunities to learn foreign language. As the use of smart phone, computer etc. is increasingly common among students; teachers need to equip themselves with today's technology. Stiller, K.D. (2007) in the book "The Modality Principle in Multimedia Learning" (p. 85) means that the smart boards can be instrumental in engaging and motivating student in the class. For instance, pronunciation though the teacher is not a native speaker can be taught to learners with ease using smart phone/board. Teachers who introduce technology to their students may get a great deal of satisfaction when they, accomplish better. Hug Theo (2007) ask that "technology doesn't constitute methodology, but teachers utilize technology to complement it. How can teachers begin to integrate technology in language teaching?) (p. 63) We can thinking first, teachers need to contemplate their aims pertaining teaching styles. Different technological materials offer different advantages therefore teachers should be aware of utilities

technology (Hug, 2007; Moser, 20015; Tolić, 2015). Teachers may apply technology to their teaching skills. As a matter of fact, when teachers use technology in class they should know students' current language skills and needs. In a nutshell, the role of technology in teaching foreign language is very significant in foreign language teaching process.

2. Method

The paper starts with the problem of whether MyPad has contributed to the development of children's linguistic and digital competences in foreign language learning (Gedik Bal, 2020), and whether the multimodal contents in MyPad are didactically designed to contribute to the development of these competences. The target group of respondents was fourth and fifth-grade elementary school children in the Municipality of Okrug Gornji, Petra Berislavić, who were assigned MyPads in teaching. The research instruments are a questionnaire and multimodal content consisting of four modes: image, sound, video, and text. The research period was from June 1 to June 15, 2019. The expected results sought to answer the outlined questions and to point out the necessity of multimodality as an antithesis to the development of language and digital competencies of primary school children when learning a foreign language. For the purpose of this research, a two-part survey questionnaire was composed. The first part relates to the section of Euro pass CV relating to Digital Skills and contains areas according to Dig Comp (The European Digital Competence Framework for Citizens, known as Dig Comp, provides tools that allow respondents to improve digital competencies). IBM SPSS Statistics 21 and various parametric methods were used to process the data obtained in this research. A t-test was used to examine the existence of a statistically significant difference in the general level of linguistic and digital competence concerning multimodal learning through MyPad. The second part of the questionnaire was intended to develop vocabulary and communication competencies with the help of multimodal function that addressed specific applications on MyPad (Mondly KIDS, Stories by Gus on the Go and Tell me More).

Multimedia software for autonomous foreign language learning generally contains nine levels of learning (two beginners, intermediate and advanced for everyday speech, and three business levels). Instead of having each student holding several volumes of printed material (e.g. general ledger, vocabulary, grammar, writing notebook). The students start from the main menu where they can choose to practice pronunciation, listen to the dialogue, watch vocabulary and grammar, see the grades for their answers. For example, if students choose the "pronunciation exercise" option, they will be able to practice word associations with other words, practice word order in a sentence, fill in the gaps in the text, write a dictation, play word and picture associations, guess correct words, solve a crossword puzzle or play "hangman" (selecting alternative words). An analysis of variance was also used to determine the difference in the level of acquisition of linguistic and digital competence concerning the environment (environment) and the students' group. It is, therefore, interactive the software in which the course and scope of learning to depend on the students' motivation and mental fitness and thus can contribute to the development of linguistic and digital competencies.
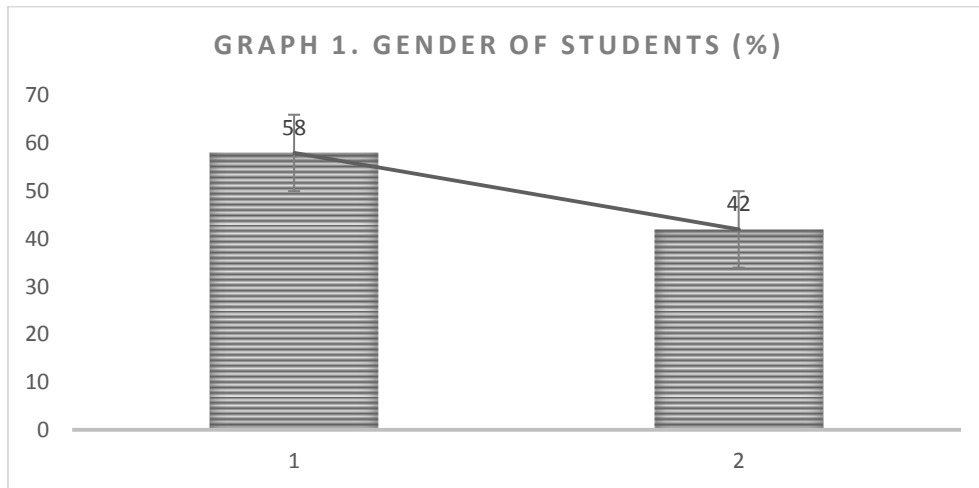
3. Results and discussion

A total of 98 subjects participated in the survey, of which 50 were fourth-grade and 48 were fifth-grade pupils.
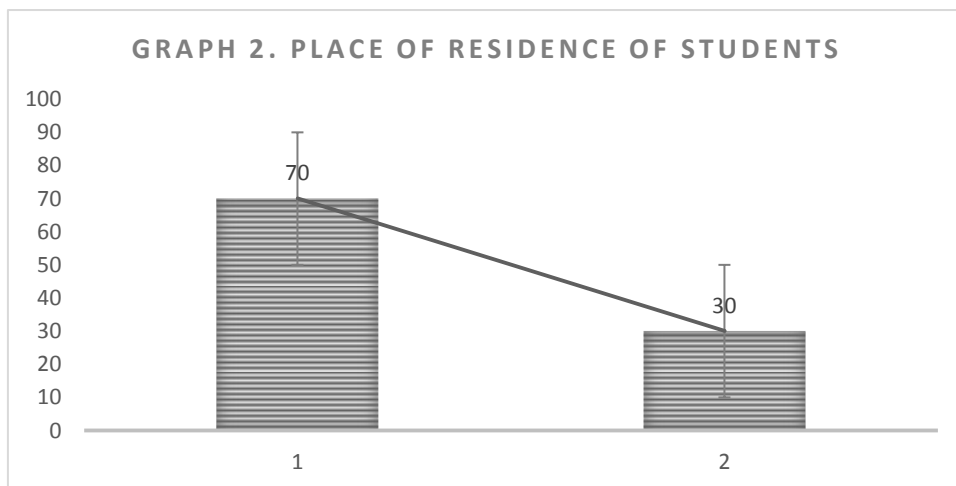
Table 1. Sample of respondents

| Elementary school P.B.	A grade	B grade	N
fourth grade	24	26	50
fifth grade	23	25	48
N			98

(Source: authors)

Graph 1. Gender of respondents (F: 58%, M: 42%).
(Source: authors)

Graph 2. Students' distribution according to the place of residence
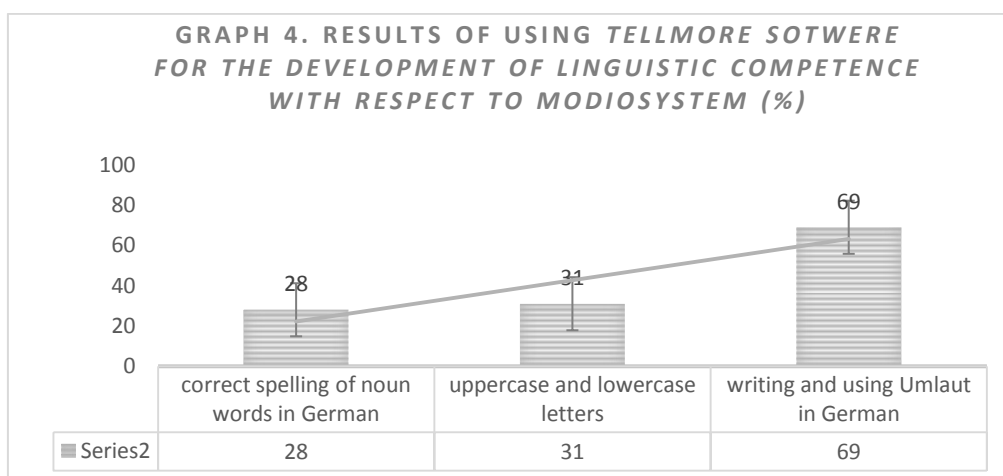(Source: authors)

As can be seen from Chart 2, out of the total number of respondents (N=98), the majority of respondents live in the city, 70%, while in the countryside, 30%.

Given that the study used three software for learning German, the following data indicate a parallel distribution of results using Tell me More, Stories by Gus on the Go and Mondly KIDS multimedia software on the development of linguistic competence in relation to multimodal content consisting of four mode systems: pictures, sound, video, and text.
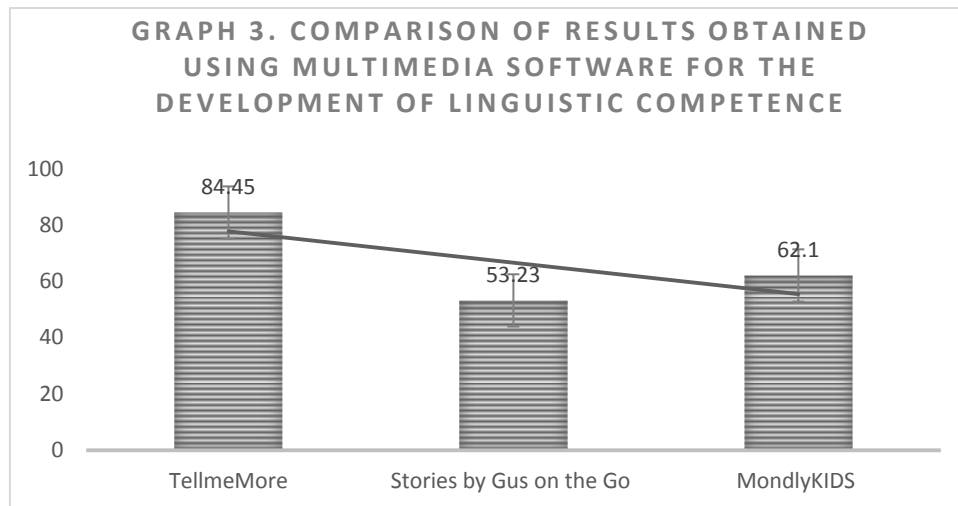
Graph 3. Comparison of results obtained using multimedia software for the development of linguistic
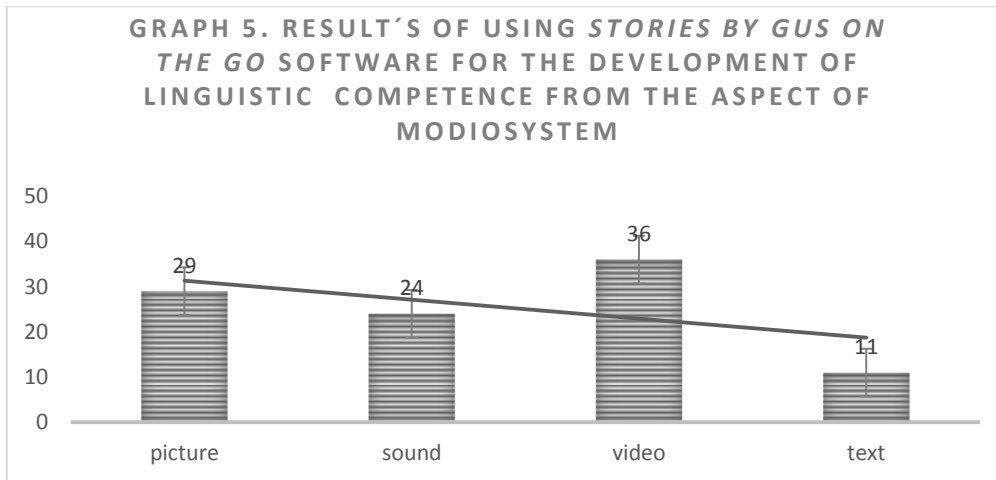competence
(Source: authors)

Graph 3 indicates that Tell me More contributed the most in the three levels of linguistic competence '(84.45%, M = 1.91, MOD = 1, SD = 1.05) in comparison to Stories by Gus on the Go and Mondly KIDS. Especially in the variable of writing sentence characters, concretely to the German Umlaut ö, ä, ü, ß.


Graph. 4. Results of using *Tellmore* software for the development of linguistic competence with respect to
modiosystem
(Source: authors)

Chart 4 indicates that the variable from the mode system (picture, sound, video, and text) was most effective in acquiring linguistic competence at all three levels: proper spelling of nouns in German, capitalization, and the writing and need of German Umlauts. Under the variable, video (64%, M = 2.05, MOD = 1, SD = 1.05) referred to the correct use of the German Umlaut, and under the variable sound (65.12%, M = 2.31, MOD = 1. SD = 1.05) for the variable spelling of nouns in German. This means that the results indicate that the most effective multisystem has proven itself in variable sound and sound in Tell me More software. Using Tell me More as a form of multimodal learning, students more easily acquired the level of linguistic competence related to the pronunciation and use of non-

German Umlauts as well as the task-solving variable (89%, M = 1.45, MOD = 1. SD = 1.22). The following graphs (5 and 6) indicate the same variables but result in the use of other multimodal learning software. Chart 5 indicates Stories by Gus on the Go software (47%, M = 2.03, MOD = 1, SD = 2.45), where it proved to be less effective than Tell me More software on MyPad and least effective in developing linguistic competence. The Mondly Kids program appeared (43%, M = 1.85, MOD = 1, SD = 1.01) with respect to all the variables of the system (picture, sound, video, and text - see chart 5).


Graph 5. Results of using stories by gus on the go software for the development of linguistic competence from the aspect of modio system
(Source: authors)
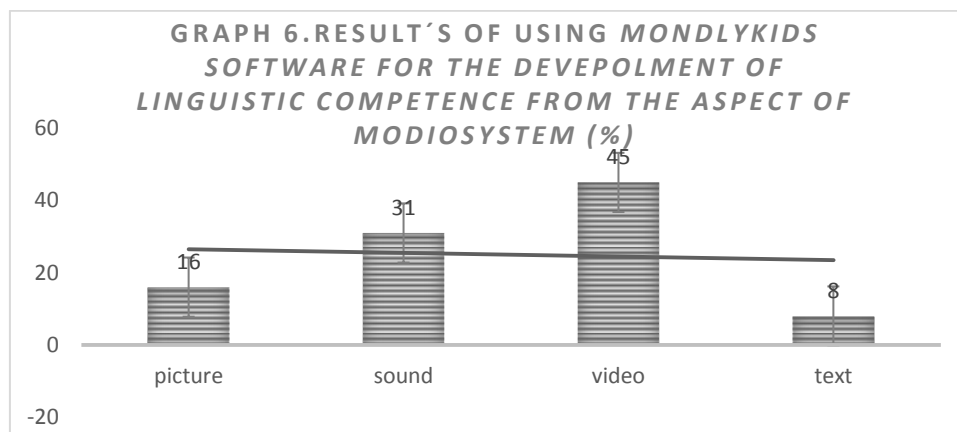
Graph 6. Results of using *Mondlykids* software for the development of linguistic competence from the aspect modiosystem
(Source: authors)

The following results relate to the level of digital competence acquisition through multimodal learning. Given that the dimensions of digital competences can be classified into three groups: 1. General digital competencies, 2. Competences for applying digital technology in education, and 3. Digital competencies for school management (according to the Digital Competence Framework for Users at School: Teacher/teachers and professional associates, principals, and administrative staff Zagreb, 2016). This is the research was based solely on the study of general digital competences since the participants were children from the fourth and fifth grades of primary school. It is this general level that implies the set of knowledge, skills, and attitudes (which include abilities, strategies, values, and

awareness) required when using digital technologies and digital media to perform tasks, solve problems, communicate, manage information, collaborate, create and share content and knowledge in an effective, appropriate, critical, creative, autonomous, flexible, and ethical manner. All digital competencies are expressed in the Framework at three levels of complexity: beginner, intermediate, and advanced. In the present research entry-level was used, which entails complexities of competence corresponding to knowledge at the level of memory, memory, and understanding, which in terms of digital competencies mainly correspond to the recognition, identification, and ease of use of digital technology tools. One of the problematic issues in the research was related to the influence of MyPad on the development of digital language competences in learning a foreign language in children, to show the importance but also to understand the importance of the properly didactic design of multimodal content. Graph 7 shows which multimodal software has contributed most to the development of the general level of digital competence in the variable: content creation and sharing, information management, communication development among students in a foreign language, development of collaboration among students, and in the solution of school tasks.
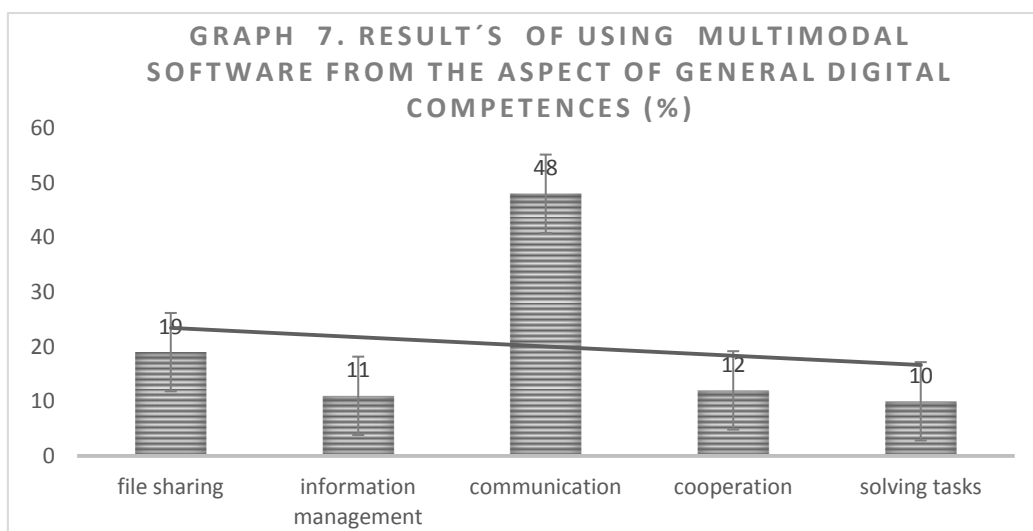
Graph 7. Results of using multimodal software from aspect of general digital competence
(Source: authors)

Chart 7 indicates that Tell me More multimodal software has contributed most to the development of students' digital competencies, thus improving the use of certain tools when learning German (92%, M = 2.04, MOD = 1, SD = 1.52). The following analysis relates to the link between students in the Linguist Competence component with respect to gender, grade, a German language prerequisite, and MyPad's prior knowledge of the digital competence level.

Table 2. Relationship between students in the component of linguistic competence in terms of gender, grade, German language knowledge, MyPad use of knowledge in terms of the general level of digital competence

	Gender	Grade	Properly didactically designed modio system	Representation of the German language course with MyPad programs
Linguistic competence	.135623	.225414	.130266	.123123
Digital competence	.055212	.212121	.323123	.145231

(Source: authors)

The correlation analysis aimed to determine the correlation of individual variables (in general, class, properly didactically designed modio system and the representation of the German language course with MyPad) on the level of linguistic and digital competence. In the correlation analysis, Pearson's linear correlation coefficient was applied, and given that it is only possible to determine statistical significance based on the coefficient, a t-test was applied to determine the significance of the correlation coefficient. As shown in Table 2, the calculated values of the correlation coefficient indicate little correlation between the acquired level of linguistic competence when using the mod system (r = .13, p≤.05) as well as with the students regarding the acquisition of the level of digital competence (r = .05, p≤.05), while a relatively weak correlation was found between the level of linguistic competence and the type of class that students attend for the German-language perimeter variable with MyPad content (r = .22, ≤.05p). If we consider each individual level of acquired linguistic and digital competence in multimodal learning to use MyPad, the results of the study showed that a statistically a significant difference was found in the level of the proper spelling of nouns and Umlaut in German and in the level of problem-solving and information sharing (x^2 = 71.89, df.7, p≤.0.5, Cramers V = .17), using Tell me More software that contained a properly didactically formatted modius system (image, text, sound, video) over others (x^2 = 69.89, df.9, p≤.0.5, Crammers V = .19) in fifth-grade elementary students compared to fourth graders. A statistically significant the difference was also found for the same variables with respect to the gender of the students. The study found that female student, using Tell me More software in MyPad, adopted higher levels of linguistic and digital competence than boys (x^2 = 71.48, df.11, p≤.0.5, Crammers V = .18). If the village and city variable is considered, the research has shown that students living in the city with respect to the village are more likely to acquire linguistic and digital competence by using multimodal learning of the same Tellme More (x^2 = 61.77, df.14, p≤ .0.5, Cramer's V = .14), especially in the variable writing tasks at the level of writing and pronunciation Umlaut ö, ä, ü, ß.

Table 3. Two-factor analysis of variance (ANOVA) - the influence of factor-level pronunciation of German phonemes with respect to the level of knowledge of the acquired linguistic competence with respect to a properly formulated multimodal learning modio system.

	SS	df	MS	F	P-value	F crit
Level of linguistic competence	1766,15	1	526,52	845,565	.00001	3,847
Pronunciation of German phonemes ([pʰ], [tʰ], [kʰ], [ç] i [x]	1213,29	1	14,85	14,654	.000133	3,847

(Source: authors)

As can be seen from the analysis of variance shown in Table 3, there is a statistically significant influence among students concerning the level of linguistic competence acquired regarding the correct pronunciation of certain German phonemes ([pʰ], [tʰ], [kʰ], [ç] and [x] with respect to properly didactically designed multimodal learning modes. According to the value, students who have acquired using the MyPad level of linguistic competence correctly pronounce phonemes for (F (1,899) = 845,565, p≤.0001) and it can be concluded that there is statistical significance in the influence of the level factors of the acquired linguistic competence using MyPad to the pronunciation of German specific phonemes.

4. Conclusions

With its existence and progress, multimedia constantly poses new challenges to technology. As a result, classical learning and teaching are leaving the classroom and multimedia is becoming an indispensable component of life and work in the teaching process. The media environment for learning and education has been enriched in the last fifteen years by numerous educational projects on the largest communication network humanity has ever created - the Internet. Although the integration of new technology into the teaching process has started again from the teachers and not from students, the use of a mobile device like MyPad justifies its existence. The research was based on the principle of modality: Students learn better from content presented by animation and narration than from animations and text on the screen. It is this research that has highlighted the need to implicate MyPad, most notably Tell me More software that can contribute to the development of linguistic and digital competencies in students when learning a foreign language. For this reason, the research was based on multimodality related to communication and interpretation through different channels. The research used an entry-level level that entails complexities of competence corresponding to knowledge at the level of memory, memory, and understanding, which in terms of digital competencies mainly corresponds to the recognition, identification, and ease of use of digital technology tools are Tellme More's the highest contributor to the three levels of linguistic competence over Stories by Gus on the Go and Mondly KIDS. Especially in the variable of writing sentence characters, concretely in German Umlaut ö, ä, ü, ß. The paper points to the fact that Tell me More multimodal software has contributed most to the development of digital competences in students and thus has facilitated the use of certain tools in learning German. The following analysis is related to the students' connection in the linguistic competence component with respect to gender, grade, German language prerequisites and MyPad's prior knowledge of the digital competence level. A statistically significant difference was found for the same variables in relation to the gender of the students. The study found that a female student, using Tell me More software in MyPad, adopted higher levels of linguistic and digital competence than boys. The paper indicates that there is a statistically significant influence among students with regard to the level of linguistic competence acquired regarding the correct pronunciation of certain German phonemes ($[p^h]$, $[t^h]$, $[k^h]$, $[ç]$ and $[x]$ with respect to a properly didactically designed multimodal mode system. The results point to the necessity of multimodality as an antithesis to the development of linguistic and digital competences of primary school children in learning a foreign German language, and this work can be exemplified as a model in learning foreign languages and to bring to the fore those who create educational materials through multimedia, and especially those who use multimedia elements to be properly didactic-methodical and formatted.

5. Ethics Committee Approval

The author(s) confirm(s) that the study does not need ethics committee approval according to the research integrity rules in their country.

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